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Tubing Machine Versatility

Plasticizing–Straining–Insulation–Tubing–Tire Treads–Mold Blanks–Continuous Strip Molding

Webster Norris

THE familiar tubing or extrusion machine has long been essential equipment in most rubber manufacturing plants because rubber, reclaims, and their compositions can be plasticized, refined, shaped, and readily worked into an endless variety of forms by extrusion through dies. In fact extrusion in rubber working ranks in importance with mixing, calendering, spreading, and molding.

Scope of Extrusion Process

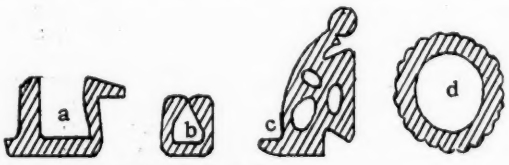
The application of extrusion of rubber through a forming die was for the production of seamless tubing, rods, and coating wire with insulating stock. Thus the mechanism became known as a tubing or insulating machine. Improvements in design, construction, operating control, and die equipment enormously extended the utility of these machines and enhanced their importance in the economy of rubber processing. In addition to their original applications for tubing and insulation tubers are now applied for plasticizing crude rubber; straining non-magnetic particles from reclaim; and extruding inner tubes and treads for pneumatic tires, stock for molding blanks, and long length strips in standard and special forms of endless variety for vulcanization without molds.

Continuous Molding

For the last named purpose the die serves to mold the material in continuous lengths and eliminates individual molds for shaping and curing the finished form. Successful operation of this method requires a first class machine and die equipment and a stock compounded for curing without distortion in open heat. Continuous molding by extrusion is resorted to for producing rubber strips of small section for such purposes as weather stripping, glazing, car body silencing, strip gaskets for closing large openings under small pressure, etc. The typical sections shown in Figure 1 represent continuously molded or extruded rubber strips for the following purposes: *a* is a weather strip to make a joint at the lower edge of a windshield; *b* is a close fitting side channel for a windshield; and *c*, a novel form of weather strip designed to receive the edge of a windshield and by compression against the glass effect very thorough exclusion of wind and rain. This action is accomplished by pneumatic resilience due to the grouping of 3 holes running the length of the strip. Their size and location allow compression of the strip to make a snug contact against the closed windshield.

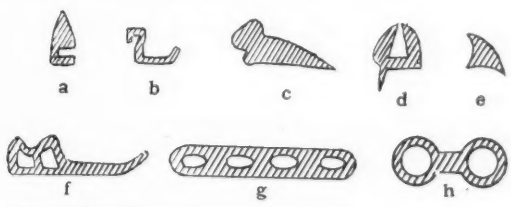
Garden Hose

Item *d* in the same figure shows a section of a corrugated tube of special interest because of the use for which it is designed: namely, garden and lawn watering. This form



E. H. Clapp Rubber Products Co.

Fig. 1. Weather Strips and Garden Hose



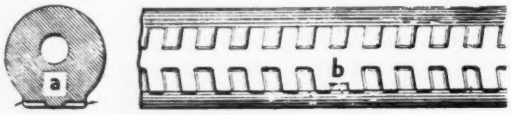
Tyer Rubber Co.

Fig. 2. Strips and Tubing

is run from dense tough stock with wall $\frac{3}{16}$-inch thick to conduct water at moderate pressure. The rubber stock is principally reclaim reenforced with carbon black and is cured in open steam. There is no fabric in the construction, and the article has taken its place as the cheapest form of competitive garden hose brought out during the current depression.

A common construction of long length garden hose consists of alternate plies of cord and rubber surrounding a central waterway. In this case the tube for the waterway, the binding ply between the successive plies of braid, and the outer rubber covering are all extruded successively. No illustration is shown of this well-known construction.

Figure 2 represents additional special shapes currently produced for the following uses: *a* is a white rubber glazing strip for a window sash; *b* is of black rubber used as a glass gasket; *c* is a black window cleaner or squilgee strip; *d*, black rubber channel strip for automobile windows; *e*,



Boston Woven Hose & Rubber Co.

Fig. 3. Section and Tread of Extruded Tire

angle packing for washing machine tub; *f*, black rubber strip with 2 internal tubular passages giving the strip increased resiliency when in service as a refrigerator door gasket; *g*, black multi-tubular strip for use with mats; *h*, red rubber dual tubing for milking machines.

Hard Rubber Forms

Goods molded by extrusion may be of wide variety in color, quality, shape, and in hardness from soft rubber to ebonite. In the latter grade a liberal range of sizes are regularly stocked by manufacturers of hard rubber as well as many other standard forms: viz., square, hexagonal, solid, and tubular, smooth, or corrugated outside. Reclaim is particularly adaptable as a component in extruded black strips because of its plasticity and ability to retain its form unchanged during open heat vulcanization.

New Type Extrusion Molding

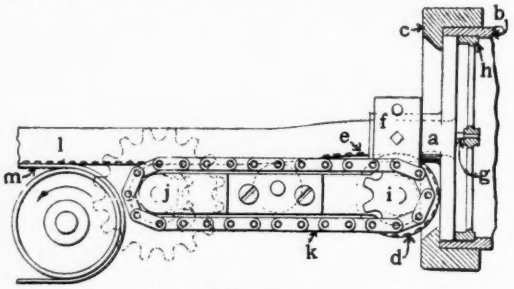
A particularly interesting product of continuous molding by extrusion is represented in Figure 3. This is an antiskid juvenile solid tire of which, *a* is the cross section, and *b* a tread view. These tires have a molded appearance and serve their purpose as well as those cured in a mold. They are patented[1] and produced by means of the special die equipment shown in Figure 4.

In this side-elevation view the stock outlet nozzle, *a*, for forming the cylindrical portion of the tire, is held in place against the head *b*, of the tubing machine by a retaining ring *c*. The tread forming unit consists of a wheel, *d*, having a transversely flat or straight circumference for forming the recesses, *e*, of the tire tread. The die wheel, *d*, is fast on a shaft journaled in a supporting frame suspended to a yoke shaped piece, *f*, which surrounds the nozzle outlet, *a*. In order to form the tread portion of the tire as rapidly as the cylindrical body is formed the nozzle, *a*, is slotted on its under side to admit passage of a segment of the revolving die wheel, *d*. By this arrangement the rubber dough as it extrudes through, *a*, takes a cylindrical form flattened on one side, which receives the antiskid design impression from the face of the die wheel. A central hole to admit wires for attachment of the tire to the wheel rim is formed within the tire by a spindle, *g*, the inner end of which is screwed into the hub of the spider, *h*. The inner end of spindle, *g*, is flush with the end of the nozzle, *a*. Thus the pin, *g*, serves not only to locate and form the hole, but preserves it from dislocation by the pressure exerted as the die wheel, *d*, impresses the antiskid design. To form properly the antiskid in the tread the die wheel, *d*, is made to move at the same speed as the cylindrical body of the tire. This result is had by gearing the die wheel to the mechanism of the extruder unit that effects the discharge of the dough through the nozzle, *a*. This connection is indicated by the sprocket gears, *i*, and, *j*, joined by the link chain, *k*. The completed tire, *l*, is thus delivered onto the conveyer belt, *m*, completely formed ready for vulcanization.

[1] U. S. Patent No. 1,877,805, Sept. 20, 1932.

Tire Treads and Solid Tires

Extrusion of forms for pressure molding is regularly practiced for making pneumatic tire treads, inner tubes, and solid tires. In such work stocks of the highest grades for tire and tube service are used. Final form and cure in such instances are necessarily obtained by vulcanization under pressure in individual molds.



Boston Woven Hose & Rubber Co.

Fig. 4. Apparatus for Extruding Tire with Anti-Skid Tread

Lino Floor Covering[1]

LINO, a product manufactured from rubber, is said to possess the same characteristics as linoleum. The lino mass consists substantially of wood flour with rubber as a binding agent. The manufacturing process of the product is simple and continuous. It is sheeted in long lengths on a calender. The process from the raw materials to the finished product, ready for sale, takes about 24 hours.

The properties and the method of treatment of the material manufactured in accordance with the new process are the same as those of the usual linoleum. Owing to the large amount of fibrous fillers, such as wood flour, the characteristic properties of the pure rubber are suppressed, and the material assumes a leatherlike character similar to linoleum.

The rubber contained in the product as binding agent is well vulcanized soft rubber with an adequate percentage of sulphur and accelerator. Extensive tests have shown that the durability of the material is first rate. It is proof even against dampness. It keeps its position when laid and will not distort so that small blocks of only 1½ mm. will lie evenly and tightly against each other. The coloring of the material is the same as for normal soft rubber, and can be produced in plain colors or marbled.

The treatment of a floor laid with lino is the same as for ordinary linoleum. It can be given a perfect polish by a rag and a small amount of wax. Owing to the stiff consistency of the lino mass a base of some other material is not necesary as with linoleum. The reverse side, however, can be made rough whenever desired.

[1] U. S. Patent No. 1,868,787.

Cutting Costs

By Applying Incentives in the Production of Mechanical Rubber Goods

Ernest F. Thayer

IN PREVIOUS articles[1] practical suggestions were given for the application of incentives in the various processes and departments of a reclaiming plant. The present paper presents certain incentive payment plans suggested for use in the manufacture of mechanical rubber goods.

Warming Mills and Calender

Where 2 or more mills warm stock for calendering, the incentive should be based upon the production of the group; and while the work could be put on straight piece work, such a system is not so satisfactory as a bonus method. First, because there would be required a large number of piece rates to cover all types of stock calendered. Second, piece work on these machines jeopardizes the possibility of obtaining properly milled and calendered stock. Third, owing to the variation in the working qualities of the same stock there would be no consistency in the earnings of the operators.

While a bonus method of incentive payment would not insure better quality of work done, or perhaps keep the production up to the level of piece work, it would, nevertheless, greatly increase production over a straight day work plan. The principle of the bonus scheme is that the operators will be paid a bonus on all stock calendered over a specified amount per warming mill hour. It should be figured on the production of the warming mills rather than on that of the calender, because each mill man has the incentive to operate his mill to capacity.

For any production over a required production per hour a bonus is paid at a certain rate per 100 pounds to every operative in the crew. The bonus should be figured daily rather than on each hourly production to save clerical work. The bonus scheme in most cases increases the production at least 30% with proportionate reduction in cost per pound of stock produced.

Extruding Operations

Although the production of extruding machines is controlled largely by their capacity, the work is amenable to piece work. While the actual extruding of the rubber cannot be speeded up to any appreciable extent, an incentive in the form of payment for the pounds produced reduces the time taken for changing set-ups, as well as the time spent in making small adjustments.

There are 3 general types of containers into which the stock is extruded preparatory to being cured in horizontal vulcanizers. These are shallow flat pans approximately 30 inches in diameter used for small tubing; round drums mounted on casters for sash rubber, etc.; and 50-foot pans for heavy forms such as hose, tires, etc.

Piece rates should be set to cover the operations of feeding the tubing machine, coiling or laying the stock on the pans or drums, and moving the filled containers away. The size of the crew necessary to do the work efficiently varies from 3 to 5 men according to the type of stock being extruded. The rates should cover all allowances for usual minor adjustments and standard changes.

It is better to give the stock warming man a bonus based on the number of batches warmed. In this way his base day's pay is guaranteed regardless of the number of machines for which he is warming; and he is not responsible for not being fully occupied. Thus when required to increase his speed sufficiently to supply extra tubers, he will be able to earn a bonus on stock warmed over a certain amount.

It might be mentioned at this point that in addition to helping reduce costs of manufacture, established piece-work rates furnish a sound basis on which to estimate total factory costs of any product.

Operating Hose Vulcanizers

One piece-work rate covering the complete operation of loading, tending, and unloading the vulcanizers is the simplest and most practical way of applying an incentive to hose vulcanizers. While, of course, the rubber is put into the heaters on various types of pans and drums, the time taken to load them is about the same. The rates should be set at a rate per complete cure. In that manner no attention need be paid to the poundage or footage of rubber cured as the incentive will have no effect upon the amount vulcanized per cycle, other than to require filled vulcanizers.

When the incentive is based upon the number of cures, it will greatly increase them as the operator will load and unload the vulcanizers as quickly as possible, which action, of course, will automatically increase production.

Dinking Machines

The operation of dinking raw biscuits from calendered sheets with a hand die and a beam dinker is usually performed on straight piece work at so much per 1,000 biscuits. The rates should cover the operation of checking the volume weight of the dinked biscuits. Any work aside from the actual dinking should not be included.

Where 2 or more dinking machines are lined up together, there should be a stock man whose duties are to deliver the calendered sheets conveniently near the machines, and to remove the boxes of dinked stock from each operator. The services of a stock handler greatly increases the production of these machines as it enables the operators to devote their entire time and attention to actual dinking.

In the absence of a volumetric dinking machine, for rubber heels, it is important that the biscuits be cut to a size of sufficient volume to give the finished heels the proper amount of overflow and insure a minimum of light heels. At the same time the volume of the biscuits must not be too great; otherwise the excessive overflow will greatly increase the material cost.

A good way to control the percentage of overflow is to provide small metal weights to the dinkers with which to test the weights of the biscuits being cut. A check of one biscuit

[1] India Rubber World, Jan. 1, 1933, pp. 40-41; Feb. 1, pp. 31-32.

from each sheet of calendered stock, with these weights, on a small pair of balance scales will assure proper volume of heel stock going to the presses. The piece rates should be sufficient to allow the operator to be careful and accurate in this volume check.

Press Molding

Straight piece-work incentives may be applied very satisfactorily to press molding. Rates are usually based upon the number of items produced or upon the number of molds pulled. Either method of payment accomplishes the same results, although when the rates are based upon the items produced, a definite cost is established upon them, whereas if paid by the mold, the unit cost varies according to the different mold capacities. By setting up standard time allowances for the different elements of the curing cycle uniform rates may be established which will pay equable rates on all types of molds regardless of their capacities.[2]

However 2 major difficulties are experienced when press molding is done on incentives. The first is the short curing evil. As a definite curing time is necessary properly to vulcanize rubber products, it is important that the molds remain in the presses the full required time; otherwise the products will be soft and defective as the rubber cools. It is difficult to control the variation in curing periods of rubber products. Attempts have been made to solve this problem by limiting the day's production to assure proper length of cure. But that method does not assure regular cures; for although the operatives may not exceed the specified production, they may pull the molds too quickly some times and too slowly at others. Other manufacturers equip their presses with automatic clocks which definitely regulate the opening and closing of the platens, thereby accomplishing the desired curing results.

The second difficulty is the carelessness of the operators in their work, resulting in many poorly molded products. This is very effectively overcome, however, by the use of a bonus and penalty scheme.[3] This idea will reduce the seconds produced far below what it would be otherwise, even though the work were done on straight day work.

Trimming Heels, Soles, and Mechanicals

As trimming mechanical goods is performed almost universally by female labor on piece work, this is undoubtedly the most practical type of incentive to use. It is also important, however, that the method employed in handling the stock to the trimming machines and removing the trimmed stock away from them be performed so that no delays are experienced by the girls waiting for more work.

To assure that a constant supply is available for each machine it is necessary to have a trimmer's tender waiting on them at all times. He delivers untrimmed heels to the benches, removes trimmed heels, as well as bagging, weighing, and recording the amount of trimmed overflow. His duties are important for his indolence or zeal can very appreciably reduce or increase the number of heels trimmed in the department during the day. He also should be on an incentive. It is usually better to establish a bonus scheme for him in addition to his hourly rate, which would increase with the increase in the number of items trimmed. This method of paying the tender is better than a piece-work scheme, because it is easily figured and makes his extra remuneration more consistent with his efforts. If he were paid on straight piece work at a certain rate per 1,000 pairs handled, his earnings might be excessive on days that runs of fast trimming stock is handled and too low on days that slow stock is trimmed, while in either case the effort required is about the same. The bonus method will accomplish the result desired on his part: namely, keeping the trimmers constantly supplied.

These observations apply just as effectively to other types of articles from which overflow is trimmed, such as rings, grommets, nipples, footwear, sundries, etc. The number of trimmers tended per man may vary, but the bonus principle applied would be the same.

On heel trimming it is advantageous also to have a penalty scheme which imposes a small penalty for heels cut by the operators. This penalty need not be large to effect an enormous saving in the number of heels spoiled by careless trimmers.

Inspecting and Packing

Inspection of finished products immediately preceding packaging is not an operation that works out entirely satisfactorily on piece work or bonus systems. When these methods are employed, a reduction in cost is made usually at the expense of the quality of the goods shipped. The management must decide whether to speed up inspection to reduce its cost and chance shipment of damaged stock; or whether to have the inspection done carefully to be sure that no inferior goods go out, even though the inspection cost is high because it is being done on straight day work. It is seldom possible to get good inspection at a low cost.

Many types of products, however, of which the production is large and the percentage of seconds small, may be inspected on piece work with small chance of seconds getting by. The product may come so uniformly good that it is possible to inspect this material very rapidly with reasonable accuracy. Rubber heels and soles are good illustrations of that type of product, and most factories employ incentive methods in the form of piece work.

A very efficient way of handling this work is to combine the inspection and packing of the heels into paper cartons as one operation. This method reduces the handling cost greatly because it eliminates one handling. The trimmed heels to be inspected should be dumped on the table immediately in front of the inspector. She picks up the heels, inspects them, and places them into the carton on a low table at her right hand. Such a procedure eliminates false motions and greatly speeds up the work.

As in the case of the trimmers, there should be a tender for the inspectors who keeps the girls supplied with heels and removes the filled cartons. He should be on a bonus incentive of the same nature as the one used for the trimmers' tender.

Hand Cutting Operations

In plants manufacturing miscellaneous small rubber parts, automobile rubber, etc., many hand-cutting operations have to be performed. The cuts made may be too intricate for a machine to perform so that the only recourse is hand work. Any job of this nature is easily adaptable to piece work, which will accomplish a great reduction in labor costs as well as notably increase production.

Miscellaneous Operations

In most instances straight piece work is the practical type of incentive scheme for the many miscellaneous operations that have to be performed in the manufacture of small mechanical rubber parts. These operations are usually short in cycle and the number of items handled is large, necessitating many workers to handle them. The tedium of constant repetition of these processes leads to clock watching on day work. This effect can be obviated only by the incentive of a piece rate that will change the point of view. Costs mount rapidly by day work on such hand work items as cutting, trimming, packing, coiling, assembling, etc.; therefore it pays both employer and employe to get such work on piece work as rapidly as possible.

[2] *Ibid.*, Sept. 1, 1932, p. 39.
[3] *Ibid.*, Oct. 1, 1932, p. 39.

Highway Safety and Rubber

Rubber Traffic Markers of All Kinds Reduce Accidents and Save Money

General Tire & Rubber Co.

Rubber Markers for Airports

ACCIDENTS have exacted from those who frequent highways tolls totaling billions of dollars, not to mention the human sacrifices to the Juggernauts of the streets. Ofttimes, though, the latter are not entirely to blame, for inadequate traffic markers may abound.

Many communities, consequently, are wrestling with the problem, and several solutions have arisen. Thus on thoroughfares are painted white lines dividing traffic lanes. Signs with colored lettering frequently brightened by lights flaunt familiar traffic legends. But the most satisfactory markers to date are of rubber, which in different forms fill varied needs here and abroad.

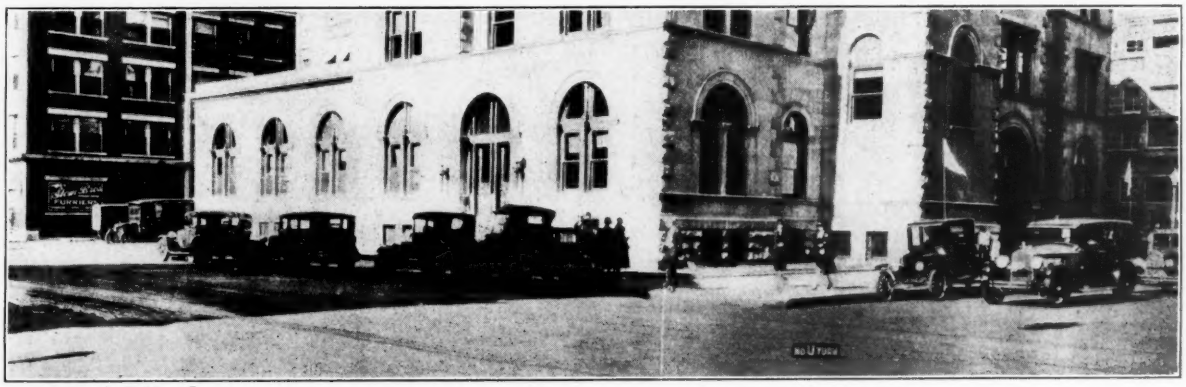
A marked improvement on these signals is their color. Sometimes the entire marker and sometimes the lettering only is yellow or orange, adopted because extensive research proved their superiority under all conditions over all other colors as to visibility. They likewise afford the greatest contrast to black asphalt pavements or the darkened surface of heavily traveled highways.

One company's marker comprises a flexible rubber panel 22 inches long, standing upright 7 inches above the pavement, with 5-inch high letters of yellow rubber vulcanized into the dark background. Rustproof aluminum surrounds the cleated base of creosoted wood with brass anchor plates. The marker, embedded in the pavement directly in the line of the driver's vision, can be read in the daytime for 500 feet, and 250 at night as it is in the focus of the headlights.

This device is easily installed. Into the top layer of pavement, without disturbing the foundation, is cut a slot 4 to 5 inches wide and 26 inches long, into which the marker is placed. Then around it is poured asphalt or concrete, which, when set, holds the signal in position.

Replacements, the rubber with creosote base attached, designated refills, are quickly inserted. The nut at the end of the wood base is unscrewed, the small top plate removed, and the old marker released. The new one is put into the aluminum case, the top plate replaced, and the nuts screwed down.

Another concern manufactures 4 styles of markers. The surface type consists of a thick orange rubber cover vul-



General Tire & Rubber Co.

To Eliminate U-Turns at Busy Intersections

canized around a circular forged steel insert to which is attached a screw anchor. The marker comes in the following sizes: 3½, 5, and 10 inches. The inlaid type, a heavy pressed steel tray into which is vulcanized a rectangular orange rubber traffic marker having a ⅛-inch crown projecting above the pavement surface, is made 5 by 10 or 20 inches and also circular 5 inches across.

The firm fashions 2 models of traffic signs. One is of tough sheets of reenforced black rubber vulcanized together and divided at the lower part to form wings which function as a rubber hinge anchorage on the pressed steel base. These wings are secured to the base by steel strips. Incidentally, all metal parts are galvanized to prevent rusting. The orange rubber letters are vulcanized into the black background. Steel studs and expansion nuts insure permanent anchorage to the pavement. Inlaid traffic signs are constructed of tough resilient black rubber vulcanized to steel and firmly held in the pavement by steel bolts. The orange letters of these signs are elongated to increase their visibility, which is further enhanced by a sloping crown.

General Tire & Rubber Co.

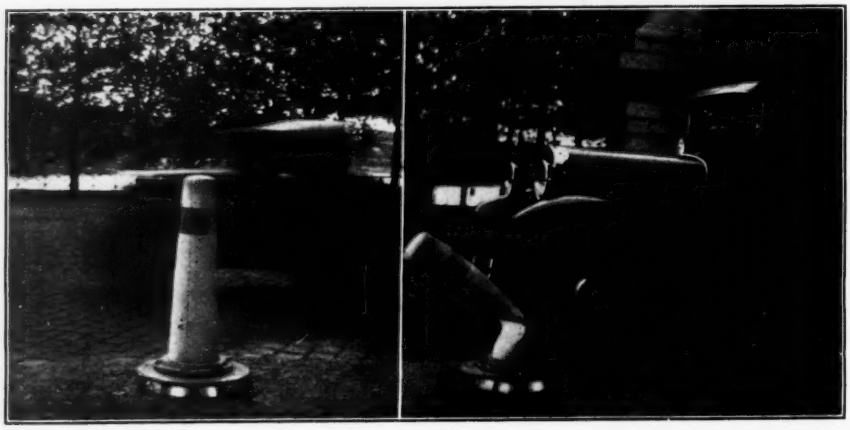
Flexible Traffic Marker

Special types of markers are made to order. One unusual pattern for railroad crossings is the attention arresting skull and cross-bones.

General Tire & Rubber Co.

For Control of Traffic in and around Industrial Plants

Rubber street pillars make satisfactory traffic barriers. They may be solid or hollow of rubber and other suitable materials so that if they are run into, they can readily recover their upright position. They are securely fastened to the ground by ingenious devices. Some of these posts also support rubber signs having indicia for guiding traffic. These pillars may be equipped with an electric lamp or reflector signs.



Rev. gén. caoutchouc

A Rubber Signal Post in Paris

Standard markers bear the following notices: boulevard, danger, detour, entrance, exit, fire, hospital-quiet, keep right, no left turn, no parking, no U-turn, one way, railroad crossing, right turn, safety zone, school, slow, stop, and street closed. In certain instances it is advisable to have a different command on each side of the sign. Single-face signals can also be furnished with street names on the reverse. Special signs can be had on order.

Opportunities for these markers are limitless. With proper wording they can be used by small towns, villages, cities, counties, and states by highway repair gangs, by bus lines when breakdowns occur, for street detours and changed traffic directions, for business establishment entrances and exits, for temporary no parking before dwellings and stores, for street names, car stops, railroad crossings, airports, and school zones.

Traffic signs may be placed where desired: in line with the curb at the intersection, on the side or in the center, exactly in the center between the 4 corners, or in the middle of the street approaching an intersection. They can be installed in concrete, brick, wood - block, macadam pavement, dirt, or graveled roads.

Many advantages are claimed for rubber traffic markers. Better wearing than others, they are more economical. Unlike signs on curbs or at sides of highways, they are right in the line of the driver's vision. Rubber markers are superior to signs painted on the pavement, for the former are not obscured by snow, sleet, mud, dirt, etc., and are visible in all kinds of weather. Because they are flexible, when a vehicle runs over them, they bend down, then spring upright; nor do they interfere with traffic or damage

(*Continued on page 32*)

Difficulties with Latex[1]

F. Harriss Cotton, M.Sc., A.I.C., A.I.R.I. (Sc.)[2]

AN OBVIOUS application of latex is in the production of dipped goods, where the ability to dispense with expensive solvents with their attendant serious fire hazards is plainly an advantage. Experience shows, however, that when a former is dipped, even in concentrated latex containing more than the normal 33 to 40% of rubber, so little fluid is removed from the bath that the rubber film formed is exceedingly thin; and in order to obtain a film of reasonable thickness the dipping has to be repeated many times. Attempts were early made to increase the viscosity of the latex so that a thicker film should be deposited at each dip; and, recently, considerable success has attended investigation along these lines. Among methods of increasing latex viscosity, one of the first suggested was to compound with a small quantity of zinc oxide, which has a peculiar action in thickening the milky fluid; but more usual methods today employ such agents as casein or glue. It is quite possible, however, to concentrate latex to such an extent that it becomes creamy in consistency and will give a relatively heavy coating with a single dip. The viscosity may also be profoundly influenced by adding certain salts, such as alum and magnesium sulphate; and by means of formaldehyde.

This last method depends for its action upon a flocculation of the individual rubber particles in the latex. Flocculation is the first step toward coagulation, and substances capable of causing the rubber globules thus to join together in little aggregates are usually able, if used in larger quantity, to coagulate the latex completely. The phenomena of flocculation and coagulation are in themselves outside the experience of the majority of those who work with rubber, except in so far as they are familiar with the changes which take place during the souring of milk.

Latex Electric Charge

Any attempt to formulate the behavior of latex under particular treatment must take cognizance of the fact that the dispersed rubber particles each carry a negative charge of electricity as shown by the way they are transported by an electric current passed through a bath of the liquid, and are deposited on the anode, the positive plate in the cell. This negative charge is probably acquired by adsorption of hydroxyl ions from the serum. As "like charges repel one another," the latex particles normally preserve their identity; but immediately acid is added, positive hydrogen ions are formed, and these neutralize the negative charge on the latex particles, which are then no longer able to repel one another, and coagulation sets in. With certain salts it is possible to achieve a type of balance whereby sufficient of the negative charges are neutralized to cause flocculation of the particles without coagulation. The study of such phenomena is assuming increasing importance in the field of latex chemistry.

Not only the rubber particles in latex, but also some of the powders commonly compounded with rubber, assume an electric charge when suspended in a liquid such as the ammoniacal serum of latex. If the acquired charge be different from that of the rubber particles, trouble may occur through mutual neutralization, followed by aggregation and subsequent coagulation. A notorious example of this type of curdling is found in the case of carbon black, which is most difficult to disperse successfully.

Much attention has recently been given to the development of protective agents which form a coating around filler particles, presumably change the nature of their electric charge and enable them satisfactorily to be dispersed in latex. Glue, gelatin, casein, white and yolk of egg are good examples of protective colloids; and certain soaps (in particular ammonium oleate) are extraordinarily efficient. The addition of small quantities of these stabilizing agents has made possible the concentration of latex by evaporation, and the compounding of concentrated latex with fillers.

A question which has exercised the minds of many interested in latex is why the rubber particles, so insular in habit when suspended in their parent fluid, should cohere with such remarkable tenacity when the latex dries? Presumably, with complete removal of the water, the electric charge disappears; but this action alone can hardly account for the extraordinary tensile strength of a freshly dried latex film. The problem is further complicated by the fact that pre-vulcanization of the rubber while in latex form does not prevent cohesion of the rubber on drying; though, as all in the rubber industry know, ground vulcanized scrap is devoid of stickiness.

Fabric Wetting

One aspect engaging attention just now is the ability of latex to wet fabrics. The use of latex in proofing has for years been an attractive proposition; but early hopes have often hitherto been doomed to failure. The dough, containing solvent naphtha, employed in normal spreading practice, actually penetrates the separate threads of a cloth, and produces a film of rubber well anchored to the fabric. Most fabrics, however, contain a slight amount of wax, grease, or dressing, antagonistic toward the watery fluid of latex; and even if the cloth be specially washed, it seems but to act as a filter, the serum of the latex penetrating, but the rubber particles themselves being deposited in a relatively non-adherent film on the surface. Various methods have been employed to increase this adhesion; by steaming the fabric, and by treating it with mordants, aluminum sulphate, for example, which enhance the normally weak affinity between fabric and rubber particles. Latex proofing and impregnation seemed unlikely to prove satisfactory, however, until the very recent development of methods whereby the wetting power of latex has been astonishingly increased. By the introduction of saponin, certain sulphonated fatty acid compounds, and alcohols of high molecular weight, the interfacial tension between latex and cotton can be so greatly diminished that the liquid may be soaked up as by a wick, and the rubber particles be carried in a stream to the interstices between the separate fibers.

Osmotic Pressure

Another example of the way in which scientific principles

[1] Extract from article "Via Lacta ad Sapientiam." F. H. Cotton, *India Rubber J.*, International Number, Nov. 1, 1932, pp. 25-28.

[2] Rubber Department of the Northern Polytechnic, London, England.

are being applied to overcome early difficulties is the use of osmotic pressure to remove water which takes so long to evaporate from a thick deposit of latex. Osmotic pressure is that pressure set up between the 2 sides of a membrane separating solutions of different concentration. Water tries to pass from a weak to a stronger solution and in so doing sets up a pressure which may be surprisingly great, as in the root pressure which forces the sap to the upper branches of tall trees.

Dipped goods produced either by direct immersion and removal of a former from a concentrated latex compound or by the use of a mold previously dipped into a slightly viscous acid coagulant, may be rapidly dried by placing into a bath causing great osmotic pressure on the outer film of coagulated latex. Alcohol has this action; or the goods may be dipped into a strong solution of some such salt as calcium chloride or sodium acetate.

The Anode Process

There are still many difficulties to be overcome in the practical application of processes which appear to offer every chance of success on a laboratory scale. There is difficulty in completely eliminating the formation of gas occlusions during electrolysis of latex in the anode process. Advance has been made, as indicated by the many patents granted for means whereby either the oxygen is evolved within a porous former around which the rubber film is deposited, or salts are added, which cause deposition of sulphur at the anode (e.g., thiosulphates), later useful in vulcanization. The latex may be electrolyzed between zinc plates after addition of a small percentage of zinc salt (when zinc will be removed from the anode and deposited on the cathode without evolution of gas, provided the voltage employed be low); or deposition of rubber may take place slowly at a voltage below the decomposition potential of the serum. The anode process, however, is not the only one in which gas occlusions present difficulties. In all dipping processes great care has to be exercised that the latex is free from bubbles; and this is often difficult to insure with thickened or compounded latex which has had to undergo a mixing process. Bubbles cause weak spots in latex goods, and cases have been known where the trouble has been sufficiently common to necessitate subsequent dipping in rubber solution to cover up faults.

Dipped Goods

Owing to the plastic nature of thickened and compounded latices as contrasted with the smooth viscosity of rubber solution, there is difficulty in producing latex dipped goods of uniform thickness, and in the case of toy balloons this has sometimes led to queer results. Quite apart from the effects due to uneven thickness, latex balloons in particular are often too tough to be inflated by mouth. Hence, the addition of softeners, such as oil, which can be readily emulsified with latex and serve to render the dried latex film more easily extensible.

Water Absorption

Many articles most readily prepared direct from latex, like surgical gloves and proofed goods, are required to withstand moisture. Much difficulty has been experienced in the past with such goods owing to the water-absorbent properties of latex films. The very nature of latex requires that each particle of rubber shall be surrounded by a coating of protective colloid having an affinity for water, and when water comes into contact with a dried latex film, it tends to soak into the rubber by virtue of its content of these substances. Problems of water spotting are particularly apt to occur in goods made from compounded or concentrated latices containing added protective material, such as soap or casein. Additions of this nature are essential in the concentration of latex by the evaporation process, and this has resulted in a preference for latex concentrated by centrifugal methods where freedom from water-soluble substances is desirable. Further research is necessary, however, in this connection, as up to the present it has not been found possible successfully to compound centrifuged latex without addition of some protective material. Therefore, where freedom from water-soluble substances is essential, latex goods often have to be boiled in water subsequent to manufacture. After this treatment the latex film dries resistant to moisture.

Lacquer for Rubber Goods

HITHERTO finishing flexible articles as balls, bulbs, hot water bottles, mats, etc., has been a difficult problem for rubber manufacturers, and rubber articles generally had the dull appearance which is associated with the term "rubber finish." This was due to the fact that the varnish and lacquer industries had not as yet developed finishing materials which would adhere to flexible rubber and at the same time be elastic enough to stand the severe bending and distortion to which soft rubber articles are subjected.

Now, however, by combining research in lacquer chemistry with an investigation of those constituents of compounded rubber which tend to deteriorate lacquer films, a lacquer was created which by its chemical nature forms a lasting bond with rubber. As a result a lacquer finish is obtained with permanent elasticity that will withstand the most severe flexing and aging tests to which flexible rubber is exposed.

This type of lacquer is generally reduced from 100-200% with thinner for dipping or spraying cured rubber and it will air dry to a tough non-marring film. When it is necessary to coat uncured rubberized fabric on a coating machine and to bake the lacquer at the same time that the rubber is cured, a slight modification of this lacquer is necessary. Leatherette cloth finished in this manner has a permanent flexible non-marring finish.

It is possible to obtain these lacquers in the usual colors although they are generally used as either a waterwhite or a black.

Highway Safety and Rubber

(*Continued from page* 30)

tires. Sometimes 4-way stop signs can be substituted for expensive electric signals. Cities using rubber markers report that traffic moves with less congestion and fewer accidents from not observing warnings.

For every traffic problem is available a rubber sign. It can mark danger points and protect pedestrians from cars emerging from blind alleys or buildings; it can designate safety zones or parking places or limit parking privileges. It can instruct a driver to stop, slow down, or turn. It thus can save money, property, and lives that might otherwise be sacrificed to motor accidents.

Concentrating Latex

Joseph Rossman, Ph.D.

THE following abstracts conclude the interesting and informative article on concentrating latex, begun in our February 1, 1933, issue.

15. McGavack, 1,772,752, Aug. 12, 1930. The invention comprises creaming latex with any creaming agent, reintroducing into another or successive fresh portion of uncreamed latex a portion of the materials separated from the preceding creamed latex in the form of serum and then either prior thereto, at the same time, or immediately thereafter, adding to the uncreamed latex the same, or a reduced, proportion of creaming agent to bring about another or successive creaming operation.

Example 1: To 500 grams of latex (approximately 40% solids) is added 0.2-part of ammonium alginate per 100 parts of solids, and then the latex is diluted to about 30% solids. This is allowed to cream; the serum is separated at the end of 24 hours, and to a fresh 500 grams of latex is added 0.2-part of ammonium alginate per 100 parts of solids, diluting the ammonium alginate with sufficient of the previous serum to bring the concentration of the latex down to about 30% solids. After about 24 hours' creaming the serum is separated from the cream. A fresh portion of latex is treated with this second serum and an additional 0.2-part of alginate in the same manner as the second fresh portion of latex was treated. Successive operations are conducted in the same manner as the last mentioned one. After about the fifth operation the resultant solids concentration of the latex cream shows a fairly constant value, which is about 98% of the original solids started with, instead of about 92% as in the case where the invention is not applied.

Example 2: To 500 grams of latex (about 40% solids) is added 0.2-part of ammonium alginate per 100 parts of solids and then diluted to about 30% solids concentration. This is allowed to cream, and separated serum together with 0.1-part of ammonium alginate per 100 parts of solids is added to a fresh portion of latex, in amount sufficient to bring the solid concentration down to about 30%. This last operation is repeated 4 or 5 times. The result is a cream containing about 92% of the original solids at half the price of the original creaming agent.

16. McGavack, 1,777,045, Sept. 30, 1930. A process for concentrating latex consists in centrifugally separating the rubber contained therein after treatment with a pectin body, in the presence of a weak organic acid, supplying additional quantities of water to the recovered rubber portion, and repeating the centrifugal separation until substantially all the water soluble non-rubber constituents have been removed from the rubber, and recovering an uncoagulated concentrated rubber dispersion.

A number of organic colloids such as Irish moss, salep root, gum tragacanth, gum arabic, and other similar materials will cause the rubber globules in latex to rise to the upper portion of the body of latex in a more concentrated form. It has now been discovered that the presence of an acid or an alkali greatly accelerates the speed with which this concentration occurs. For example, latex containing Irish moss with a small amount of citric acid or other weak organic acid will separate into a layer considerably faster than a similar body of latex treated with Irish moss alone. As only a very small amount of acid is added, the increased speed cannot be attributed to coagulation, for the resultant concentrate may be completely dispersed in water to give a rubber latex not appreciably different from ordinary rubber latex.

As an example of the increased rate of concentration with organic colloids containing small amounts of acid, the following may be mentioned. A colloidal solution is made up of 0.5-part by weight of Irish moss to 100 of water. Citric acid to the amount of 1.4% of the weight of the moss is added. Of this mixture 0.6- to 0.9-part by weight is added to 100 parts of rubber in the form of latex. The concentration will start in about an hour, as compared with 4 hours or more for latex treated with Irish moss alone.

If the citric acid be replaced by an equal weight of sodium hydroxide, an acceleration of the rate of concentration is observed, but not to the same degree. In general the fruit acids, citric, tartaric, malic, lactic, etc., possess the same property of accelerating the rate of concentration. The separation and concentration accomplished by the use of pectin bodies is more rapid and greater than the use of organic colloids alone, and in most cases is even more efficient than the use of organic colloids alone, with small amounts of organic acids.

Pectin bodies occur in fruit juices such as those of apples, cherries, citrus fruits, gooseberries, and other fruits. These pectin substances yield viscous solutions with water, and by their transformation into pectic acid by the enzyme pectase they produce the so-called vegetable jellies. The pectin bodies are believed to be compounds of various carbohydrates of acid groups, the composition of which is unknown. The molecular complexes known as pectin bodies may be readily hydrolized. Under the influence of oxidation reactions they form pectic acid. In this respect the pectin bodies differ from the so-called vegetable mucilages, for the latter, when oxidized, yield mucic acid.

In applying the pectin bodies to the treatment of latex, the pectin may be obtained in several ways, as from any one of the ordinary fruits such as orange, lemon, citron, apple, by a water extraction of the pulp of the fruit, or it may be employed in its pure state as it appears on the market for use in making fruit jellies; or the pulp of the fruit together with the juice may be used as such. One half part to 3 parts of the pectin body are added to 100 parts of rubber in the form of latex containing 35% of rubber. The latex is then thoroughly stirred and allowed to come to rest. Within 2 or 3 hours the separation into 2 layers occurs; the upper layer is a pure white cream, and the lower a steel-gray colored liquid. The rubber will be found in the upper layer in a higher concentration than it was originally present. For example the concentration may be increased from the original 35% of rubber to as high as 80% of rubber in the same volume. The degree of concentration can be controlled by the length of duration of the concentration process, and it is also influenced by the original concentration of the latex. If the original latex contains but 10% of rubber, the time lapsed until 80% is reached is obviously longer. Heat-

ing has the effect of increasing the speed of concentration, and this fact is of advantage when dilute latices are being concentrated.

17. Elder and Hill, 1,804,157, May 5, 1931. The process comprises adding creaming and vulcanizing agents to latex, heating the latex to effect vulcanization while creaming occurs, allowing the vulcanized latex to stand until substantially maximum creaming has been effected, and recovering the vulcanized creamed portion of the latex.

The following is a specific example. An ammonia preserved latex may be treated with about 10% by volume of a creaming agent in the form of a 2% solution; various creaming agents such as plant saps, fruit juices, or gum tragacanth are suitable for this purpose. This treating may be immediately followed by the addition of vulcanizing agents, for instance, 2% sulphur, based on the weight of latex solids, together with about 1% zinc oxide and about 0.5% of an accelerator such as piperidene pentamethylene dithiocarbamate. The latex may be stirred to effect a uniform distribution of the added materials therethrough; whereupon the latex may be heated to about 75° C., and this temperature maintained for about 2½ hours, stirring being effected only during the first half hour of vulcanizing, if at all, as during this time only a minor part of the vulcanization is effected.

After vulcanization it will be found that the volumetric ratio of "cream" or latex concentrate and serum will be about 2:3; the solids content of the cream is about 47.0%, and that of the serum about 5.2. The vulcanized latex concentrate may be removed or recovered from the serum, preferably after allowing the mixture to stand for about 24 hours or longer, to insure maximum creaming or concentration, and used for the desired purposes. When films were prepared therefrom and tested, they showed a tensile strength of 3,280 lbs. per sq. in. and 950% stretch as compared with a tensile strength of only about 500 lbs. per sq. in. and a stretch of 750% shown by films prepared from the latex used as a raw material.

18. Loomis and Stump, 1,816,018, July 28, 1931. Natural latex is first rendered alkaline to the usual indicator phenolphthalein, by adding ammonia or other suitable alkalies, as sodium carbonate, potassium carbonate, sodium hydroxide, potassium hydroxide, etc.

A small amount of colloidal substances, as glue, gelatin, agar-agar, casein, etc., is next added to act as protective colloids for the solid particles of the material. The fresh latex, thus treated, is then centrifuged. The lighter solid particles gather at the center in the centrifugal action, and the water separates out toward the periphery. The concentrated material may be drawn off from the center, and the thin material flow from the outer edge. This action may be carried to an extent that the concentrate drawn off is almost, if not quite, of solid form, a thick cream or paste being easily attained. The glue, gelatin, agar-agar, casein, etc., being lighter than the water of the latex, materially assist in the centrifuging action; these materials physically carry the rubber particles to the center of the revolving body material. The protective colloids thus act to provide the concentrate of rubber in a zone or portion of the material. Water may later be again added to this concentrate to bring it back to its original consistency, the concentrate itself being easily dispersible in water.

19. Wescott, 1,816,242, July 28, 1931. The process of concentrating latex comprises subjecting a continuously moving stream of latex to a progressively increasing centrifugal force, separating the inner cream layer, and concurrently washing the layer with water during the application of centrifugal force, and removing the washed cream from the influence of centrifugal force as an effluent and gradually decreasing velocity.

A machine suitable for this purpose is described in patent No. 1,630,412, May 31, 1927.

The latex may be first concentrated by centrifugal action in the way described, then washed with a weak solution of, say, sodium carbonate, to remove acid impurities, and finally the sodium carbonate replaced by a weak solution of ammonia. This action gives a pure, stable rubber emulsion, free of acid impurities as well as of the natural solutes of the natural latex.

20. Forrer, 1,825,515, Sept. 29, 1931. The object of this invention is to produce aqueous dispersions of rubber, the viscosity of which is greater than the viscosity which could be reached with concentration before the point of inversion, without being of pasty consistency, in order to render these dispersions more suitable for dipping, spreading, painting, spraying, etc.

Additional substances, as sulphur or other vulcanizing substances, filling materials of any description, softeners, dyes, accelerators, antioxidizers, and all kind of substances used in preparing mixes of rubber, balata, or gutta percha may be added to the dispersion.

To an aqueous rubber dispersion containing about 35% rubber and 1% free ammonia so much of a hot aqueous solution of gelatin is added that the mixture contains 1 to 2% gelatin and at least 0.5% ammonia. After cooling for several hours the mixture forms a solid gel. When the mixture is heated thereupon for about 6 hours to 80° C., it will form a liquid of the viscosity of an oil varnish which will not gel on cooling.

21. Hauser, 1,831,492, Nov. 10, 1931. A process of concentrating latex includes adding mucilages or substances combining with water and heating to above 90° C.

Example 1: 1,000 ccs. of a 40% latex concentrate are mixed with 100 ccs. of a 2% aqueous solution of diagum, and steam is passed through the liquid for half an hour reckoned from the time when the liquid bubbles (boils). The liquid, then allowed to stand, in the course of a few hours separates into 2 layers, the upper one of which is a latex concentrate, and the lower one a rubber-free generally somewhat dark colored serum which can now either be poured away or worked up to the desired serum constituents.

Example 2: The mixture having the composition set forth in Example 1 is introduced into an autoclave and heated for one hour under a pressure of 2 atmospheres. The further behavior of the latex is analogous to that described in Example 1.

22. Lindgren, 1,831,500, Nov. 10, 1931. Rubber latex usually contains between 30 and 40% of rubber. It has been found possible, by centrifuging, to obtain, from 100 liters of rubber latex, about 50 liters of concentrate containing about 60% rubber and about 50 liters of skimmed latex containing about 10% rubber. To effect such separation it has been found necessary to use a separator of maximum efficiency. For this reason it is almost imperative to use separator bowls provided with conical "disks." With certain kinds of latex it has been found that the disks quickly become coated with slime, which after a few minutes' separation accumulates to such an extent as substantially to fill the spaces between the disks. The bowl must then be dismantled, and the slime removed.

The process of this patent comprises 2 centrifugal separating processes in the first of which are removed the impurities, or the great bulk of them, including impurities that are liable to stick to the separator bowl as well as relatively non-adherent solids, and in the second of which the latex is separated into 2 parts, one containing more and the other containing less rubber than in the original latex.

Two different types of centrifuges are used for each creaming operation. In one type all the latex passes through a part of the bowl which has a strong centrifugal action. The

disks extend at a wider angle to the bowl's axis than is customary in separators of this type so as to facilitate the sliding outward along the disks of such of the solid impurities as are separated out between the disks. They do not extend out close to the periphery of the bowl, but only so far as to leave a surrounding chamber of substantial radial dimensions.

In this centrifuge the solids and slime constituents are to a substantial extent separated out in the open space surrounding the disks and accumulate on the bowl wall. That part of the latex that flows between the disks has a reduced content of impurities, and the remaining impurities that are removed in the constricted separating chambers between the disks slide outwardly, comparatively freely along the disks and do not tend to accumulate thereon or clog the separating compartments.

In the other type of centrifuge, when the purified rubber latex discharged from the bowl is admitted to the feed tube of the second bowl, it flows up through the disk orifices and distributes itself through the separating spaces between the disks, where a separation occurs similar to that characterizing the separation from whole milk of skim milk and butter fat. The disks extend at a comparatively small angle to the axis of rotation. They are quite close together and extend radially forward to the periphery of the bowl. The lighter creamed latex containing 60% rubber flows directly inward and thence upward to the light discharge and escapes passing through that part of the bowl that has the maximum separating effect.

23. Van Arsdel and Hill, 1,831,895, Nov. 17, 1931. This process comprises mixing vulcanized latex with more than 25% unvulcanized latex, adding a creaming agent, and recovering the creamed portion of the mixture. The creaming agent, gum tragacanth, plant sap, or fruit juices, may be added in amount equal to about 10% by volume of the mixture of latices and in the form of about a 2% solution. The rate of creaming may be increased by heating the mixture of latices containing the creaming agent for a short period of time, a temperature of 70° C., for instance, being maintained for about ½ hour; whereupon the composition may be allowed to stand for about 5 to 24 hours, or possibly a week, to insure maximum separation of the concentrated, rubber containing portion from the aqueous portion.

24. Nikitin, 1,880,975, Oct. 4, 1932. The invention comprises adding an anti-creaming agent to the latex subsequent to creaming. Further creaming is thereby avoided. By this means it is possible to cream a latex to any desired concentration without difficulty. The following example is given. To 1,000 grams of ammonia preserved latex is added 0.72-gram ammonium alginate; when a cream of solids concentration of 50% is reached, to the cream is added about 1 part of saponin per 100 parts of solids in the cream, after the serum is removed. Further creaming is retarded.

Although the amount of anti-creaming agent may be reasonably varied, in general the best results are obtained with substantially ½ part to 3 parts per 100 parts of solids, of the negative creaming agent.

25. Strezynski, 1,885,154, Nov. 1, 1932. The process of concentrating latex comprises centrifugally separating the latex into a rubber concentrate containing a major proportion of the larger rubber globules and a dilute rubber phase at a relatively high rate of feed in a separator adjusted for high concentration, diluting the concentrate with water, centrifugally separating the concentrate into a rubber concentrate and a dilute rubber phase, and from the first named dilute phase centrifugally collecting and concentrating relatively small rubber globules at a relatively low rate of feed in a separator adjusted for comparativey high recovery.

The Smaller Plant's Advantages[1]

D. R. Stevens[2]

IN THIS illuminating address the author discussed the possibilities of the smaller manufacturing plants in the matter of making a better comparative showing than the large plants, by resorting to able, well-trained, level-headed management, a simple organization, and elimination of needless red tape.

If the small plant is troubled with the reciprocity argument forced upon its customers by the intimidating statistics of big business, a thoughtful reference may be made to those figures supplied by the 1929 Biennial Census of Manufacturing showing that 99% of manufacturing plants in this country contained less than 500 employes.

The greatest asset of a small plant is its ability to give quick action. A small organization with definite responsibilities eliminates the necessity of a tedious checking of departmental and company policies and obtaining of O.K.'s. A small plant may concentrate on one specialty and know its subject well and it may impress its customer on that account better than many a larger company with so-called diversification where replies are slow, understanding is difficult, and deliveries drag.

The small plant has a wonderful opportunity to handle its labor policies smoothly and without misunderstanding. It needs no complicated industrial relation system. It can *anticipate* and *prevent* where the large industry is forced to *struggle* and *settle* and it has this advantage because the manager and foremen can be alert to their problems as soon as they present themselves.

The small plant can be alert to have the best of machinery equipment and the best research equipment and staff. It is wrong to assume that the great company has unlimited resources in this regard. The great company is so big and the demands upon it are so complicated that it is frequently out of date with machinery, and its research on any given subject is retarded by the complexity of the many demands upon its research staff.

David A. Weir, of the National Association of Credit Men, points out that the large concern has fixed obligations as to dividends and interest on plant and equipment. The small concern by its very nature has been unable to finance so readily through bonds and stock and thus has avoided the difficulties of that system which are embarrassing great industry today. The small plant should avoid copying big business in the maintaining of useless offices in large cities, which policies tend toward bankruptcy. If it keeps fit, the little business will stand up and win out over many a big business.

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[1] "Taking Stock of the Smaller Plant's Advantages." D. R. Stevens. Presented at a meeting of the Taylor Society, Inc., Society of Industrial Engineers, and American Marketing Society cooperating at Hotel Pennsylvania, New York, N. Y., December 8, 1932.

[2] Vice president and works manager, The Okonite Co., Passaic, N. J.

EDITORIALS

Future Rubber Planting

DECLINING rubber prices created problems for the planter which will require heroic measures in cost curtailment if European and American companies are to save their industry from the menace of the trend toward native planter monopoly.

In the early days of rubber planting first cost of plantations was considered a minor item in the plan of development, as the promise of return even on high capital cost was great enough to satisfy the most optimistic promoter. Many of the pioneer companies paid dividends of 200 and 300% on their capitalization as a reward for their foresight.

From the beginning were 2 schools of thought in rubber cultivation, brought about largely by the diverse training of the individuals responsible for the operations. The Ceylon planters had learned their principles of tropical agriculture in coffee and, remembering the severe lesson taught by devastation due to disease, planted their rubber in clean, cleared land and practiced clean weeding. Withal, their first costs were not excessive as the land had been cleared for coffee culture.

The Dutch planters through long years of experience in tropical agriculture had developed careful and expensive methods, especially in the cultivation of tobacco. When rubber came along, they applied the same care in cultivating rubber that they had with coffee and tobacco. All jungle was not only felled and burned, but stumps were moved, and small roots carefully grubbed and raked out of the soil. A finished rubber estate became a veritable garden and clean weeded as a rose garden.

On the other hand many planters in the Federated Malay States were men without horticulture training and were limited in their expenditures by hard headed London directors, with the result that many plantations were made in rough cleaned land without the removal of stumps and large logs.

Disease was known to exist in both types of plantings; therefore there has always been controversy between the advocates of clean clearings and of planting by rough methods. But even the advocates of rough planting never brought forth the argument to apply the well-known principles of forestry to the planting of rubber.

But it has remained for the pinch of adversity to bring into favorable consideration methods of rubber forest development which among the professional planters have been considered heretical.

To those who have developed plantations of carefully cultivated trees through seed selection and budding, the problem is most confusing. Shall the trees which have been budded and developed to potential production of 2,000 pounds per acre be abandoned to the encroaching jungle, or shall the results of scientific study and large capital expenditure be cared for during the depression in the hope of high yields and increased prices later on? Will the trees actually suffer from the result of forest encroachment, or will they actually be benefited?

Convincing arguments are advanced for both sides of the question; but as capital becomes depleted, the problem will probably be solved in its natural course regardless of sentiment and desire.

It is well known that Hevea in Brazil grows naturally in the forest with no cultural care and produces over long periods of years. It is known also that seedlings will develop into more hardy stock than nursery propagated plants, the roots of which have been amputated in the process of transplanting. But seed selection cannot be relied upon to give uniform stands of high yielding strains, and for this reason bud grafting has been practiced as the method which will produce uniform stands true to type. Several generations are necessary, however, to prove that desirable characteristics have been transmitted to and fixed in the new stock. After the desirable traits have been developed, as proved by uniform stands of a particular type of clone set in isolated stands so as to avoid cross fertilization, it may then be possible to perpetuate the strain by seed propagation.

The reason that seeds from rubber trees do not produce uniform results is that the trees planted in East India represent hybrid stock containing the elements of several different types, all of which may be found in the Amazon in their original habitat. Even selecting seeds from high yielding trees does not guarantee that all the progeny shall be of the desirable type. Only by repeated selection and elimination of undesirable specimens can a fine commercial tree be developed.

Under present stressful conditions it is probable that experiment will be greatly curtailed, but it should be borne in mind that the cost of scientific direction is small compared with the gross expenditure. It would be a great pity if the fine work which has been done should by any chance be lost by the curtailment of the intelligent groups of scientists who have devoted their lives with such brilliant results to the rubber planting problem.

What the Rubber Chemists Are Doing

Bentonite

THE development of latex and water dispersions on a manufacturing scale has brought to notice a number of materials previously without interest for the rubber industry. One of these materials is bentonite, a clay of volcanic origin that possesses certain fundamental properties differing decidedly from other clays. It functions as a thickening, plasticizing, adhesive, and absorbent agent in many compositions in different industries. It is inorganic, inexpensive, and stable. Its unique property of swelling and making a thick gel in water can be controlled or inhibited by simple additive agents.

The following is given as an average analysis of the highest type of Wyoming bentonite.[1]

	Percentage as Shipped	Percentage Calculated as Moisture Free
Moisture at 110° C	7.49	.....
Silica	59.57	64.63
Alumina	19.67	21.34
Ferric oxide	2.91	3.15
Ferrous oxide	.26	.28
Titanium oxide	trace	trace
Sulphur	trace	trace
Lime	.66	.72
Magnesia	2.46	2.67
Potash	.29	.31
Soda	2.09	2.27
Ignition loss (chemical water)	4.73	4.73
Total	100.13	100.10

Most of the particles are from 0.1 to 0.5 microns in size (4 to 20 millionth of an inch).

The material adsorbs 5 to 6 times its weight of water and swells 14 to 16 times its dry bulk. When saturated, it forms a gelatinous mass. In 30 parts water, 85% remains in permanent suspension.

By reason of this characteristic property bentonite is finding considerable application in water dispersions of rubber and in latex compounding. It is used as a thickener and not as a reenforcing agent and only in dispersions or latex cements that are not to be cured. Bentonite has a very marked retarding effect on the vulcanization process, attributable to the high adsorptive capacity of this clay. In ordinary mill mixed crude rubber it makes the stock too difficult to cure except an excessive dosage of accelerator be used which amounts to wasting it.

[1] American Colloid Co., Transportation Bldg., Chicago, Ill.

Hard Rubber vs. Synthetic Resins

SYNTHETIC resins are extensively displacing hard rubber for molded articles in both old and new applications. The overwhelming advantages in favor of molded resins are both technical and economic. They are summarized in a recent contemporary article[1] from which the following data are gathered.

As a matter of fact hard rubber is seriously handicapped on the score of its color limitations, slow vulcanization, lack of mold finish, etc. Hard rubber is paramount as an electrical insulator for certain purposes, also as tank covering, pipes, etc., for protection of industrial apparatus against corrosive liquids, fumes, and gases. Hard rubber is rapidly being eliminated from the molded plastic field of utilities by the development of synthetic resin molding powders. The following is an abstract from the article mentioned.

The beauty of synthetic resin moldings is that they leave the mold with a bright, polished finish; shrinkage or distortion is negligible, and little finishing is required. Ebonite moldings require buffing and polishing and, consequently, cannot compete with the resin as regards finish or cost of production. Resin moldings have one minor defect: they are more brittle than good class ebonite, but in certain articles this fault is of little importance.

Recent improvements have been made by introducing fibrous material into the resins, thus rendering them shock resisting.

In the following table the properties of phenol-formaldehyde resins and ebonite are tabulated:

	Phenol Formaldehyde Resin	Ebonite
Specific gravity.	1.30 to 1.50.	1.15 to 1.30.
Colors	Practically all except white.	Black, brown, and red.
Finish	Excellent from mold. Requires no polishing.	Matt finish from mold. Requires polishing.
Di-electric strength (volts per mil.)	600.	1,000—1,200.
Tensile strength (lbs. to sq. in.).	2,000—6,000.	1,500—10,000.
Compressive strength (lbs. to sq. in.)	24,000—30,000.	2,000—5,000.
Effect of aging..	None, if properly hardened.	Tends to discolor. Depends on state of cure.
Water absorption	Up to 2%. Depends on cure.	Very slight. Varies according to ingredients used.
Heat resistance..	250—270° C.	Pest ebonite 90° C. Specially compounded 150° C.
Oil resistance Mineral	Practically unaffected.	Softens slightly.
Vegetable	Practically unaffected.	Unaffected.
Alkali	Slight effect.	Unaffected.
Acids Strong	Decomposed.	Slight effect.
Weak	Slight effect.	Unaffected.
Metallic inserts.	Unaffected generally.	May corrode in time.
Machining	Fair. Tends to be brittle.	Fair to excellent, depending on pigments.
Time and temperature of cure.	2 to 10 min. at 275° C., according to thickness.	20 to 120 min. at 190° C., according to quality and thickness.
Surface insulation, ¼-in. distance on test piece	10,000 megohms to infinity.	100,000 megohms to infinity.
Molding tolerance	0.005 per inch.	0.020 per inch.
Brinell hardness.	40—50.	70—90.

Laminated products, such as paper or fibrous materials, impregnated with liquid synthetic resins, pressed and hardened under heat, are also now competing with ebonite, and, as these can be produced in beautiful colors and effects, this competition is likely to become more severe in the future.

If hard rubber is to hold its own against synthetic resin moldings, it is essential that it be produced in competitive bright colors, resist surface deterioration, cure in less time to meet competitive cost of resin molding, and produce finished objects which are polished from the mold.

[1] "Why Hard Rubber Is Losing Ground to Synthetic Resins." *India Rubber J.* (International Issue), Nov. 1, 1932, pp. 16-17.

A. C. S. Rubber Division Meetings

Chicago Group

THE next meeting of the Chicago Group, Rubber Division, A. C. S., will be held Friday evening, March 10, 1933, in the College Inn, Chicago, Ill. Dinner will be served at the usual nominal charge. Following this the assemblage will adjourn to the Crystal Room for the technical program.

J. Kirschner, chief chemist, The Dryden Rubber Co., Chicago, will present a paper on "Cracking of Rubber When Exposed to Atmospheric Conditions." This paper will be illustrated, and the strong and weak points of the formulas regularly used in the industry will be discussed in detail.

Thomas Wolf, district traffic manager, United Air Lines, will speak on "The Application of Rubber to Aviation." This paper will be illustrated by a moving picture entitled "Across America Flight." This film, a pictorial narrative of a flight from California to New York, includes many remarkable views of planes flying over scenic and historic country and aerial views of 14 cities along this 2,700 mile route. Handling air mail and express, dispatching planes at air ports, and other interesting features will be shown.

Reservations for this meeting should be mailed to B. W. Lewis, Secretary, Chicago Rubber Group, care of Wishnick-Tumpeer, Inc., 365 E. Illinois St., Chicago, Ill.

Boston Group

THE Boston Group, Rubber Division, A. C. S., will hold its spring meeting at the University Club, Boston, Mass., on April 6.

A paper will be presented by S. G. Byam, of E. I. du Pont de Nemours & Co., Inc., on "Problems of the Proofing Industry." A second paper will be given by E. M. Hayden, technical director of the Stanley Chemical Co., on "The Uses of Lacquer in the Rubber Industry."

Dinner will be served at 6:30 p.m. Tickets at $1.75 each may be obtained by writing to J. J. Sinder, Secretary-Treasurer, care of Converse Rubber Co., Malden, Mass.

Akron Group

THE winter meeting of the Akron Rubber Group, A. C. S., was held Monday evening, February 27, 1933, at the Akron City Club, Akron, O.

After election of officers, the following papers were presented: "Tire Cord and Other Fabrics" by L. A. Graybill, chief technical chemist, Bibb Mfg. Co., Macon, Ga. "Asbestos and Rubber Combinations" by S. Collier, chief chemist, Johns-Manville Co., Waukegan, Ill. "Naphtha vs. Gasoline Refining and Effects on Materials Produced" by B. C. Dodd, Eastern Division Manager, Anderson Prichard Oil Corp., Akron.

Effect of Curing Temperature on Quality of Vulcanized Rubber[1]

Norman A. Shepard and John N. Street[2]

THE customary practice with respect to the effect of curing temperature on the quality of vulcanized rubber is given in the following excerpt from the authors' paper.

The effect of curing temperature on the quality of vulcanized rubber has been a moot question for many years, especially since the advent of organic accelerators which permit rapid curing at comparatively low temperatures. In the old days, when the rubber technologist had at his disposal only such materials as litharge, lime, or magnesia for the acceleration of his stocks, a curing temperature below that corresponding to 40 pounds' steam pressure (287° F. or 141.5° C.) was impractical. It was common practice to use even higher temperatures (50 pounds, corresponding to 298° F. or 148° C., or above) in order to increase the output per curing unit. The organic accelerators available at present permit curing at temperatures as low as 15 pounds' steam pressure (250° F. or 121° C.), as, for example, with one of the thiuram mono- or disulphides; or 25 pounds' pressure (266.5° F. or 130° C.), as, for example, with mercaptobenzothiazole, in a length of time which is commercially practical. This is true even in the case of such large thick articles as automobile tires. With the former type of organic accelerator, a small tire, such as a 4.75, may be cured in 1 hour; and with the latter material (mercaptobenzothiazole), in almost the same length of time provided a sufficient concentration of accelerator is supplied. With the larger sizes of tires, of course, the time must be increased to a very considerable extent in order to obtain the proper cure in the plies and at the base of the tread.

What is gained by using such active accelerators is a question worthy of serious consideration. Their use necessitates very careful processing in the factory to avoid scorching during the milling, tubing, and calendering operations, and requires the installation of expensive equipment for rapid cooling after each operation. Once it has been learned how to incorporate these materials successfully, the question of curing temperature constantly arises, even though the curing time at low temperature is no longer than that of the stock which the new and faster compound may have replaced. A higher temperature will mean shorter cures, and pressure for production is often the deciding factor in raising the temperature. The question thus becomes one of cost *vs.* quality, and that latter point has never been conclusively settled. Technologists have glibly stated as a commonplace that "of course, low-temperature curing means added quality. Heat is detrimental to rubber. There is no room for argument." A search of the literature reveals nothing to substantiate such statements definitely. It is true that certain accelerators have produced remarkable physical properties in stocks cured at low temperatures, as compared with the products obtained with other accelerators at higher temperatures of cure. Here the specific action of the accelerator in improving quality is involved, and it is difficult to differentiate between this effect and that of the curing temperature itself.

Comparing the results of their research on the physical properties of 2 typical tire tread stocks, before and after aging in the Geer oven, oxygen bomb, and natural aging for 1 year, the authors record their conclusions as follows:

A review of the literature permits no definite conclusion concerning the influence of temperature of vulcanization on the ultimate quality of a rubber product. Some investigators claim equal properties at different curing temperatures; others superior properties at low temperatures; while still others believe superior qualities are obtainable at higher temperatures. Concerning the influence of temperature on aging, no conclusive data are available.

The temperature of cure has no influence on the tensile properties at maximum, in the case of the di-o-tolylguanidine stock. In the case of the mercaptobenzothiazole stock, there is a trend toward slightly higher tensile strength as the temperature is decreased.

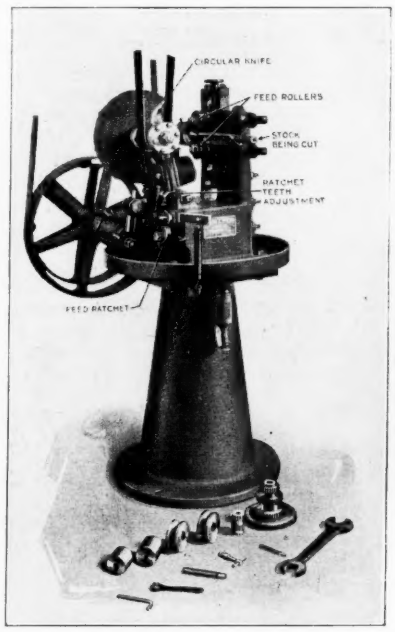
Natural as well as artificial aging of the di-o-tolylguanidine stock shows that the lower the temperature of cure, the better the aging will be. The results are clean-cut, probably owing to the fact that this is a stock which ages rapidly and hence shows differences in comparatively short periods of aging.

The data on the mercaptobenzothiazole stock containing an antioxidant are far from conclusive though they show a trend toward better aging with lower temperatures of curing.

[1] Presented before the meeting of the Division of Rubber Chemistry, A. C. S., Detroit, Mich., Feb. 25 and 26, 1932. *Ind. Eng. Chem.*, May, 1932, pp. 574-79.

[2] Firestone Tire & Rubber Co., Akron, O.

New Machines and Appliances



Thropp Washer Cutter

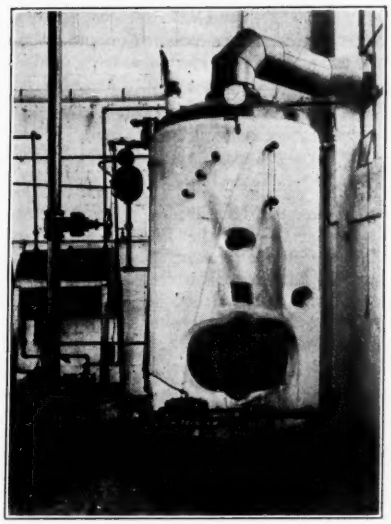
Automatic Power Disk Cutter

THE machine here pictured is an automatic power disk cutter designed for cutting washers for hose connections, bottle stoppers, and other extruded rubber products ranging in diameter from ¼-inch to 1¾ inches and in length from 3/32-inch to 1½ inches. The speed of output ranges from 95 to 200 pieces a minute. The various lengths of cut are provided by 3 changes of gear for the feed rollers and one change on the feed ratchet.

The tubing to be cut is received in a V-shaped holder from which it is fed through a pair of bushings. The circular knife having a speed of 2,568 r.p.m. is supported on a rocker arm which allows the knife to pass in and out between the 2 bushings. The knife is 10 inches in diameter protected by a substantial cast-iron guard. A water connection is provided to allow a continual flow of water on the cutting edge of the knife. The main wearing parts are equipped with ball bearings, lubricated by the Alamite system.

Two sets of feed rollers are provided. One set is used for the smaller diameter and the other for the larger diameter.

The remaining items of the complete equipment include 3 sets of bushings, 3 sets of feed roller gears, 2 ratchets, 2 circular knives, countershaft, and small wrenches. Further particulars can be obtained from William R. Thropp & Sons Co., Trenton, N. J.



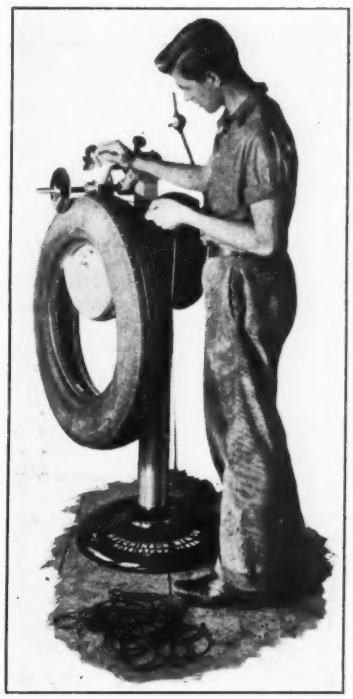
McKee Automatic Steam Boiler

Laboratory Steam Boiler

THE illustration represents a 10 h. p. automatic gas-fired steam boiler suitable for vulcanizing purposes in rubber testing and research laboratories.

This boiler is equipped with gas burners of the latest atmospheric type. All combustion is under direct control of the amount of steam actually used, by means of an automatic gas controller set, for example, at a 90 pounds steam pressure. When the set pressure is reached, the controller automatically cuts down the main flow of gas, permitting only enough to pass to keep the burners lighted. The full gas flow does not come on again until the steam pressure has dropped below the desired point and then only for long enough to bring it up again. Thus only enough gas is burned to produce actually the steam used. Not only that, but a constant steam pressure is maintained, which is of the utmost importance in rubber laboratory work.

The automatic condensation unit consists of a receiver tank to which the condensate returns. From here it is pumped into the boiler as needed by a mercoid control device installed on the boiler. It is conceivable that some steam or condensate may be lost through leaks or due to the nature of the application. The unit is therefore provided with a make-up water valve to add water from the city main to make up for any lost. Then in case the electric current or water supply should fail, the boiler is protected against running with little or no water by the low water fuel cut-off. After the level has dropped below a certain limit the entire fuel supply is cut-off automatically. Eclipse Fuel Engineering Co., Rockford, Ill.



Bussa Studio

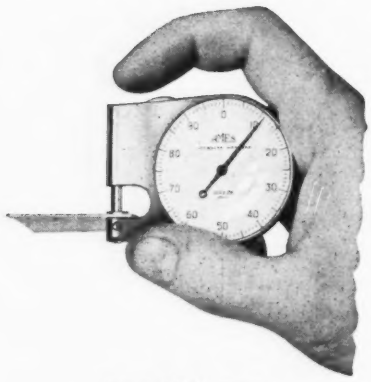
Hutchinson Tire Groover

Tread Groover for Pneumatic Tires

THE operation of cutting grooves in the smooth worn tread of a deflated pneumatic tire is pictured in the illustration. The device comprises a motor driven pulley upon which the tire casing is placed. Adjustable guiding disks are set against each side of the casing to keep it revolving in the same plane during the cutting process which is done automatically. When using this machine, you need not mount the tires upon wheels or rims, but simply place them over the pulley, as seen in the illustration, and turn on the power. The operator needs only to adjust the knife to the proper cutting depth, and the grooved portion comes out as a single long strip. It requires but 2 or 3 minutes to complete the entire job, and because the machine is motor driven instead of by hand, the cut is uniformly even, and the appearance of the tire is much improved.

The features of the machine are its ease of operation; no mounting, dismounting, or inflation of the tire required; elimination of the labor of hand work; the speed of the operation; and the uniformity of the grooves.

The manufacturer solicits inquiries from the trade for further information regarding this machine. Hutchinson Mfg. Co., Inc., Norristown, Pa.



Ames Dial Gage

Dial Thickness Gage

A VERY handy pocket gage for measuring the thickness of sheet materials speedily and accurately is shown by the illustration. In applying the instrument the spindle is raised to open the anvils by turning the operating wheel at top. The anvils close with uniform spring tension when the operating wheel is released, eliminating the personal element and giving the same dial readings for all users.

The dial is graduated in thousandths, and measurements in half-thousandths are plainly indicated. The number of graduations the pointer passes as the anvils are opened are counted and compared with the chart stamped on the back of the gage to determine the nearest common fractional equivalent. Reading the dial is as quick and easy as telling time with a watch. Being thin, light in weight, and with no sharp corners this gage is convenient to carry continually in the vest pocket. B. C. Ames Co., Waltham, Mass.

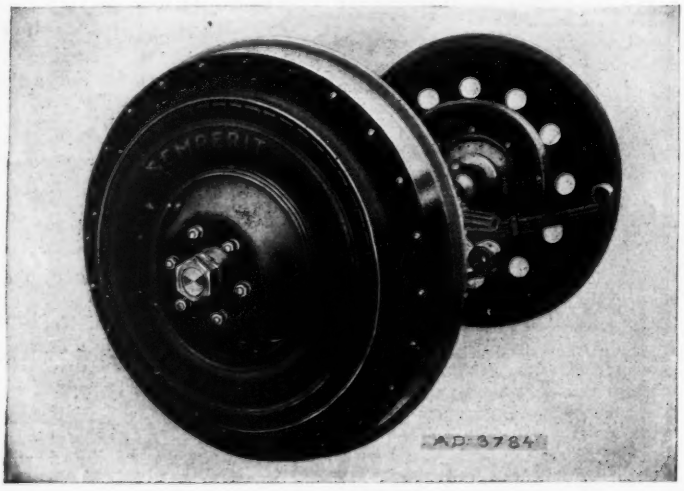
Air Suspension for Rail Bus

RAILWAY rolling stock of the lightest possible weight, now generally conceded to be one of the essential features for economic rail operation, is made possible primarily by the use of pneumatic tires. The problem of supporting wheels on rails by pneumatic tires has been solved by a system of air suspension in which the tire rolls within the rim of standard railway profile on the railroad track.

A pair of wheels with axles is represented in the illustration. In this combination the steel guiding wheels have internal cylindrical surfaces which form the tracks of the pneumatic tires. The steel guiding wheels are mounted on anti-friction bearings in pairs upon the outer ends of guiding axles. These axles have no metallic or other connection with the chassis frame, thus preventing the transmission of shocks or noises from the rail joints to the frame.

The pneumatic tires supporting the load are mounted in pairs on a separate axle which transmits the load to the chassis in the usual manner by leaf springs. Since the pneumatic tires roll within the wide cylindrical surfaces of the track wheels, the carrying capacity of each wheel is not limited by the width of the rail head, but can be increased to any practical desired amount. The pneumatic tire contacts with the track of the steel guiding wheel over approximately ⅕ of its circumference. This gives ample tractive contact between them without possibility of the tire slipping. The driving power applied to the tires is therefore fully transmitted to the track wheel and then to the track. The remaining ⅘ of the tire circumference is not in contact with the track wheel; therefore the tire is free to expand and to radiate heat.

There is absolute safety in case of blowouts, and no stops for tire changes are necessary. In case of puncture the axle carrying the load wheel drops ¾-inch and comes to rest upon the guiding axle, which then assumes the function of load carrier. Since the load is not carried on the deflated tire but on the guiding axle, the car continues to run without possible damage to the tire with but little less riding comfort owing to the elimination of the cushioning effect of the deflated tire. E. K. Howe & Sons, Inc., 500 Fifth Ave., New York, N. Y.



Air Suspension Wheels

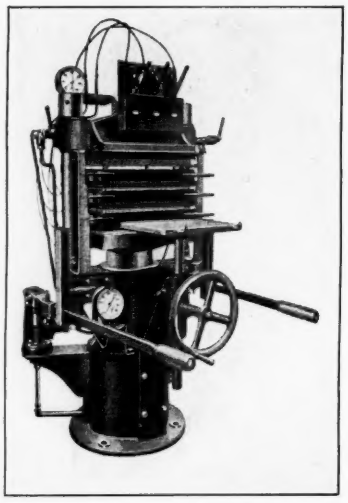
Pipe Savers

SARCO pipe savers are brass ferrules which fit snugly into the threaded ends of pipe, protecting it against the action of corrosive elements in steam, water, gas, oil, chemicals, etc. These sleeves have been tested under extreme conditions and are fully guaranteed to reenforce and make strongest what is ordinarily the weakest part of the pipe. Not only do they prolong the life of pipe, but they save the loss of production, damage to property, and the labor, time, and materials wasted by leaks and replacements.

Regardless of the present life of your pipe, these pipe savers will at least double it. For further particulars address Sarco Co., Inc., 183 Madison Ave., New York, N. Y.

Vulcanizing Press

THE hand operated hydraulic press pictured is specially adapted for molding and curing small articles of new rubber or pulverized rubber scrap compositions. It



Electric Press Vulcanizer

is a substantially built machine fully equipped either for factory production or laboratory work. It has 3 decks 35 by 45 cm. (about 14 by 17¾ inches) and is an accurately built piece of mechanism with all working parts easily accessible.

Jack-knife switches are located on top of the press for applying current to the heating elements of each plate; the temperature is shown by a dial indicating instrument mounted on top of the press. The molds are handled in and out of the press by an adjustable table that can be raised and lowered to the different deck levels by means of a hand wheel conveniently located for the pressman.

A hand hydraulic pump is bracketed to one side of the press base; while on the opposite side the pressure is released by a hand lever to permit the press to open. The pressure gage is located adjacent to the pump within easy view of the operator. The current consumption of the vulcanizer is 22 kilowatts per day of 8 hours. Roca & Guix, Barcelona, Spain.

New Goods and Specialties

Sponge Rubber and Pyralin

EVERYONE knows, especially from his own experience, how children dislike having their hair washed because of the soap that trails into innocent eyes and ears. At last, however, a sympathetic and enterprising manufacturer has created a device to protect tender features.

This E-Z Adjustable Shampoo Mask, as it is called, consists of a pad of soap- and waterproof sponge rubber and a front shield of du Pont Pyralin. The mask is placed over the child's head and made to fit over the ears by an adjustable rubber cord in the back. The masks are made in 4 popular colors. Although they are designed primarily for use by children, many an adult also will find these masks a blessing in disguise. Steckler Sales Co., 106 E. 19th St., New York, N. Y.

E-Z Adjustable Shampoo Mask

Plioform Tableware

AN INTERESTING new molding composition derived from rubber has been announced. From this material, known as Plioform, a wide range of molded goods can be manufactured at low cost, samples of which are pictured in the illustration. The material is available in a large variety of colors and types producing attractive mottled and opalescent effects. Plioform is entirely suitable for tableware, being tasteless and odorless and resistant to scratches. It is also unbreakable in the same sense as most high grade plastics and has qualities such as resistance to hot water and discoloration by sunlight or age which make it a superior molding compound for fabricating sundry good-looking novelties and gifts.

The new product is made of pure pale crepe rubber, but unlike any molding types of hard rubber contains no sulphur and requires no vulcanization. In the manufacture of the molding compound the rubber is dissolved in a solvent and a chemical action allowed to take place which results in the formation of a white granular product not unlike granulated sugar in appearance. This is the pure resin compound which, when molded, forms highly transparent articles of a light amber color. More often the pure resin is mixed with a filler and whatever pigment is desired and then milled for thorough dispersion of pigment, filler, and resin compound. This solid sheet is then broken down into granulated form for molding.

In addition to the usual lines of kitchen aids, sundry novelties, and laminated goods, Plioform compound has excellent possibilities in the molded electrical parts field owing to fine non-conductive qualities which make it especially suitable for such parts as radio tube bases. The Goodyear Tire & Rubber Co., Akron, O.

"Continental" Line

THE FAULTLESS RUBBER CO., Ashland, O., is now marketing an improved line of druggists' sundries, known as the Continental. The 3 pieces: No. 100, hot water bottle, No. 102-FF, combined fountain-douche-bulb syringe, and No. 110-FF, combination bottle and syringe, feature equipment including important new syringe improvements as the Faultless Forc-Flo attachment, hard rubber shut-off and concealed pipe holders, extra large ($\frac{7}{16}$- by $\frac{1}{4}$-inch) tubing on the de luxe design, and 3 screw pipes: special vaginal spray, rectal, and infant. So that the stopple can not be lost, it is chained to the bottle tab.

Each rubber piece of the set is very heavy gage and far over-capacity. Three colors are available: ivory, tan, and green, with insets in contrasting color. The designs of the insets include representations of Mt. Vernon and the head of George Washington.

New Van Cleef Product

Tite-On Rubber Half Sole

IN KEEPING with the times, people want to save on shoes; consequently Van Cleef Bros., Woodlawn Ave., 77th to 78th Sts., Chicago, Ill., developed Tite-On rubber shoe soles. They can be applied by any person on any kind of shoe, taking but a few minutes, for no tools are required, only a specially prepared rubber solution sold with the soles.

These non-skid soles with their deep tread, made with new live rubber and not loaded with shoddy, are said to outwear leather. They are available in black or tan in a range of sizes to fit every shoe for men, women, and children.

Tite-Ons will convert ordinary shoes into sport shoes for golf, tennis, hiking, etc. The motorist, by putting these rubber soles on his shoes, prevents wear and tear on leather caused by pressure on accelerator button, brake, and clutch.

Molded Dishes

Rubber Industry in America

OHIO

Goodrich Activities

The B. F. Goodrich Co., Akron, has announced major changes in its tire sales division. W. C. Behoteguy, merchandising manager, is named manager of the automobile tire department, responsible for sales of Goodrich passenger car tires and aeronautic sales. W. C. Bray continues as manager of Goodrich truck, bus, solid and industrial tires and air containers. W. G. Kearney is assistant manager in charge of national, railroad, taxicab, state, county, municipal, reciprocal, and mileage accounts. J. A. Hoban becomes manager of the retail department in charge of activities of Goodrich Silvertown, Inc., retail division of the company, and other subsidiary retail operations. Sales control is under the direction of H. J. Lintner, assisted by E. A. Seeley in charge of personnel.

Two former Goodrich district advertising managers have returned to the Akron offices and assumed new duties. V. C. Carr, former district advertising manager in Boston and the New England states, takes up special staff duties, and L. T. Greiner, former district advertising manager in Kansas City, is assigned to the sales promotion department.

The operation of the winter Share-the-Work plan in the Akron factories of the Goodrich company since October 1 has resulted in the retention or the recall of approximately 500 workers, according to Vice President T. G. Graham, who declared, "Since Goodrich began its general program of spreading work throughout the entire organization, it is estimated that on present weekly schedules a total of 4,000 have been held in employment."

The following Goodrich employes were awarded 20-year pins during February: Claude Connell, Henry Faller, Ira Houser, Russell H. King, Louis Marthey, Mark Matulin, Charles Pullins, John Schmidt, John Soper, and Herbert Harrell.

With May 15 as the date for its completion, work on the new building at Delaware and North Sts. for the Indianapolis, Ind., branch of the Goodrich company, and the superservice center of Goodrich Silvertown, Inc., is being rushed. The new structure, to cost approximately $50,000, will be one story high, of brick, concrete, and steel and will be one of the largest and most complete service outlets of its type in the state. It will be on property 195 by 160 feet.

The Griswold-Eshleman Co., advertising agency with offices in Cleveland, has been awarded the Goodrich mechanical goods division advertising, according to J. H. Connors, Goodrich vice president.

Ruthrauff and Ryan, Inc., with principal offices in New York and Chicago, recently was appointed to conduct advertising for the Goodrich tire and rubber sundries divisions, including Miller sundries.

McCann-Erickson, Inc., will continue to handle Goodrich footwear advertising.

Cockfield, Brown & Co., Ltd., Canadian advertising agency, received the 1933 advertising contract of Canadian Goodrich Co., Ltd., Goodrich subsidiary. Extensive use of newspapers and magazines is planned, according to R. C. Groffmann, Goodrich advertising manager in the Dominion.

Company Earnings Survey

The New York Sun recently compared earnings of 41 leading American industrial concerns for the fiscal years 1931 and 1932. This survey shows that only 11 of these companies did better in 1932 than in 1931. Four of these 11 firms suffered deficits both years, but their 1932 losses were less than those of 1931. Only 3 of these 11 organizations made a profit both years.

The most striking improvement in business in 1932 was made by the other 4 of these 11 companies, for each of them had had a deficit in 1931, but turned it into a profit in 1932. Of these 4 concerns, the largest net profit was that of The General Tire & Rubber Co., Akron, which reported a net income for 1932, after all charges, of $202,353. The 1932 net profits of the other 3 companies ranged from $37,372 to $150,032.

Of the 30 companies with worse showings in 1932 than in 1931, 6 showed a profit in 1931, but a deficit in 1932; 9 a deficit in 1932 greater than in 1931; and 15 showed less profits in 1932 than in 1931.

The decline in the net income of all these 41 concerns in 1932 as compared with 1931 was 18.2%.

The General Tire & Rubber Co., Akron, at the recent annual meeting of stockholders, reelected the following directors: W. O'Neil, W. E. Fouse, C. J. Jahant, G. F. Burkhardt, T. F. O'Neil, J. A. Diebold, R. W. Gallegher, and J. R. Kraus. Following the stockholders' meeting the directors reelected the following officers: W. O'Neil, president; C. J. Jahant, vice president; W. E. Fouse, vice president and secretary; Charles Herberich, treasurer; and T. Spencer Shore, assistant treasurer.

Stewart Bolling & Co., Inc., 5207 Lakeside Ave., Cleveland, carries a most diversified stock of new and used rubber machinery.

The Faultless Rubber Co., Ashland, through Advertising Manager H. S. Lett announces that Western Wiles is its sales manager.

Tire Prices Cut

The Firestone Tire & Rubber Co., Akron, recently precipitated a tire price war when it unexpectedly reduced prices 5 to 10% to meet the competition of the mail order houses, Montgomery Ward & Co., St. Paul, Minn., and Sears, Roebuck & Co., Chicago, Ill., who promptly retaliated by slashing their qoutations 2 to 15%. The rest of the industry was dismayed, but some of the tire manufacturing companies reluctantly followed Firestone's lead, including the Murray Rubber Co., Trenton, N. J., and the Seiberling Rubber Co., Akron. Further developments are expected.

A. G. Cameron, vice president and general manager, Goodyear Tire & Rubber Export Co., Akron, recently received a 20-year service pin from P. W. Litchfield, president of The Goodyear Tire & Rubber Co. Mr. Cameron's first work for Goodyear was selling tires at St. Louis, Mo. Before the year was out he was made district truck tire manager. The next year he became branch manager at Dallas, Tex. Three years later he returned to St. Louis as branch manager. Early in 1919 Goodyear decided to expand its export activities; so Mr. Cameron was called to Akron to become manager of the Australasian division. The following year saw him manager of the sales department, and 1922, manager of the export department. In 1923 he was named vice president and general manager of the newly created Goodyear Tire & Rubber Export Co.

The Aetna Rubber Co., 4710 State Ave., Ashtabula, manufactures rubber gloves, hard rubber automotive parts, battery boxes, refrigerator parts, washers, gaskets, table tops, flooring, and parts made to customers' special designs. Trade names used by the company include Ace, Neptune, Saturn, and Priscilla for gloves and Artex for table tops. Company executives are S. T. Campbell, president; L. P. Howard, secretary-treasurer; and R. B. Hess, purchasing agent.

The Canadian General Rubber Co., Ltd., Galt, Ont., through President E. Barringham, announced that it has discontinued its selling arrangements with the Hayes Products, Ltd., Toronto, and in the future will conduct its own sales force direct from the head office in Galt. For the convenience of its customers the company has established offices in Montreal, Toronto, Winnipeg, and Vancouver to carry small stocks of soles, heels, sheet, and dipped rubber goods.

EASTERN AND SOUTHERN

Well-Known Chemist

Prominent among the chemists of the rubber industry is Ernest Bain Curtis, vice president of The Naugatuck Chemical Co., 1790 Broadway, New York, N. Y. He began his successful career in 1913 as a student in the United States Rubber Co.'s factories. In 1915 he was assigned to the development and research division of the company's General Laboratories. So well did he do there that by 1920 he was assistant director of the laboratories. In 1926, however, he was transferred to a U. S. Rubber subsidiary, The Naugatuck Chemical Co., to become sales manager. His efforts here were rewarded by his promotion to the vice presidency in 1930.

Blank-Stoller, Inc.

E. B. Curtis

Mr. Curtis was born in Martinsville, Ind., April 14, 1890, and attended Indiana University, from which he received his A. B. in 1912 and his A. M. in 1913, having majored in chemistry.

His name is proudly included on the rosters of the American Chemical Society, Alpha Chi Sigma, the Masonic bodies, and the Dunwoodie Golf & Country Club.

Fenner, Beane & Ungerleider, crude rubber broker, 60 Beaver St., New York, N. Y., on February 1 admitted Hugh W. Long to the firm.

Turner Halsey Co., 40 Worth St., New York, N. Y., manufactures Mt. Vernon and Woodberry cotton goods for the rubber industry. Officers are C. D. W. Halsey, president and treasurer; H. M. Turner, vice president and secretary; G. M. Miller and A. O. Hero, vice presidents; F. S. Bruyn, assistant secretary; and E. B. Ware, assistant treasurer. The company maintains branches at 99 Chauncy St., Boston, Mass.; Continental Trust Bldg., Baltimore, Md.; 323 S. Franklin St., Chicago, Ill.; 329 Tchoupitoulas St., New Orleans La.; and Room 500, Postal Telegraph Bldg., San Francisco, Calif.

A. S. T. M. Meetings

The 1933 regional meeting of the American Society for Testing Materials will be held in New York, N. Y., March 8. The technical feature will be a symposium on lubrication.

Spring group meetings of A. S. T. M. committees will be held at the Hotel New Yorker, New York, March 6 to 10, 1933. The thirty-sixth A. S. T. M. annual meeting will take place June 26 to 30 in Chicago, Ill.

Committee D-11

Committee D-11 on Rubber Products has prepared new tentative specifications for insulated wire and cable: performance rubber compound, for friction tape for general use for electrical purposes and for rubber insulating tape. The new tentative methods of chemical analysis of rubber products have been adopted as standard.

Work is in progress on test methods for wrapped and braided hose intended to replace the present detailed hose specifications which are little used. The proposed methods have been circulated for criticisms in advance of publication. In the study of life tests and correlation of accelerated aging with natural life, considerable data have been accumulated which are being closely studied.

In the work on rubber products for absorption of vibration, a special instrument for the determination of compression set at elevated temperatures has been investigated by the subcommittee which is working on a standard method for conducting this type of test. This subcommittee is also undertaking the study of methods for testing fatigue under repeated compression in products used for the absorption of vibration.

A new subcommittee is being organized for the standardization of methods of testing adhesion between rubber and metal with particular reference to the use of this combination in automotive products used for the absorption of vibration.

The recently organized subcommittee on dynamic fatigue testing has formed 2 sections, one for investigation of test methods on flexing of rubber fabric combinations which results in ply separation and the other for the investigation of flex cracking of rubber.

Binney & Smith Co., with principal office at 41 E. 42nd St., New York, N. Y., and factories and branches throughout the country, manufactures carbon and lamp blacks, stearic acid, mineral rubber, oxides of iron, clays, talcs, rubber chemicals, and crayons. Company trade marks include Micronex, Fumonex, Velvetex, Elastex, Stearex, Dustless Micronex, Plastex, Batex, Mollex, Ultra-Micronex, Colloidal Micronex, Micronaid, Isperex, Stearex Flake, PARMR, Mapico Colors, and Crayola. Edwin Binney is president; A. F. Kitchel, vice president; and F. R. Cantzlaar, secretary-treasurer.

Edward F. Rolle

Veteran Rubber Man

Edward F. Rolle can look back with pride on his business career, for it is one freighted with successful achievement. He was born on July 4, 1867, in Chicago, Ill., and later attended the local public schools. The years 1884 to 1887 he devoted to ranching.

In 1889 he entered the employ of A. Featherstone & Co., Chicago, and the next year won the managership of its New York, N. Y., branch, 545 W. 22nd St. Mr. Rolle here first made the Featherstone Dunlap pneumatic bicycle tires, which then sold for $35 a pair as the demand far exceeded the supply. In 1892 he was appointed superintendent of the manufacture of Featherstone bicycles at the Ames Mfg. Co., Chicopee, Mass. The following year he became branch manager of the Waverley Bicycle Co., Atlanta, Ga.

When the war with Spain broke out in 1898, Mr. Rolle joined the United States Volunteers Army, First Texas Cavalry.

In 1900 he organized and became president, a position which he has held ever since, of the Rolle Rubber Co., 296 Broadway, New York, with Chicago branch at 508 S. Dearborn St. The firm acts as wholesale distributer and jobber of rubber bands, sponge rubber, mats, matting, tubing, hose, sheet packing, and a general line of rubber material.

Mr. Rolle is a member of the Masonic bodies and commander of the United States War Veterans. He is also one of the early subscribers to INDIA RUBBER WORLD.

A Correction

St. Joseph Lead Co., 250 Park Ave., New York, N. Y., announces that its lead free zinc oxide has been adopted by some of the leading rubber goods manufacturers for use in rubber mixings where zinc oxide is indicated because of the satisfactory results obtained. Stocks of lead free zinc oxide are being maintained at the more important consuming centers in the United States.

Rubber Footwear Tariff

The Tariff Commission, Washington, D. C., announces that President Hoover has issued a proclamation increasing duties as specified in its report on fabric upper, rubber soled footwear, and boots, shoes, and other footwear, wholly or in chief value of rubber.

The report indicates that the present rate of 35% assessed on the foreign value of footwear having fabric uppers and rubber soles should henceforth be assessed on American selling price; and that with respect to boots, shoes, and other footwear wholly or in chief value of rubber, the present rate of 25% assessed on the foreign value should hereafter be assessed on American selling price. These, the maximum increases permitted by law, become effective March 3, 1933.

The Commission instituted this investigation at the request of the President and of The Rubber Manufacturers' Association, Inc., representing about 80% of the domestic industry.

Competition in the United States from foreign sources became important during 1932 when the volume of footwear imports increased while unit import prices decreased. The number of footwear with fabric uppers and rubber soles imported represents about 10% of domestic production; for footwear wholly or in chief value of rubber the ratio of imports is about 3%, but imports increased during the late months of 1932.

The Commission finds that Japan is the principal competing country for oxfords and sandals having fabric uppers and rubber soles, and Czechoslovakia for lace-to-toe shoes and boots, shoes, and other footwear, wholly or in chief value of rubber.

Rand Rubber Co., Sumner Ave. and Halsey St., Brooklyn, N. Y., recently opened a sales and display office at Room 404, 358 Fifth Ave., New York.

Templar Oil Products Co., Inc., 129-51st St., Brooklyn, N. Y., makes cements. Walter Marvin is president, and F. E. Larkin, secretary and purchasing agent.

The Research Information Service of the National Research Council will revise its "Industrial Research Laboratories of the United States, including Consulting Research Laboratories," the fourth edition of which, published in 1931, contained over 1,600 such laboratories. If the reader is a member of a firm maintaining a research laboratory and does not know whether his firm is listed in the previous bulletin, it is hoped that he will forward immediately a request to the Research Information Service, National Research Council, 2101 Constitution Ave., Washington, D. C., for a questionnaire so that the forthcoming bulletin may be as complete as possible. The listing involves no financial obligations and may be of considerable value since this publication is recognized by all familiar with it as a valuable source of information regarding industrial research activities in the United States. The bulletin will not be available for distribution before September, 1933.

National Adhesives Corp., 820 Greenwich St., New York, N. Y., specializes in gum, paste, and glues. The company operates factories and maintains warehouses from coast to coast.

The R. & H. Chemicals Dept. of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has opened a Charlotte, N. C., office at 300 W. First St. The manager is R. M. Levy, formerly in charge of The R. & H. Peroxygen Sales in the New York office. Assisting him on sales is LeRoy Kennette. J. C. Robertson and C. D. Potter, bleaching experts, have also been assigned to the Charlotte branch. The company moved its Cleveland, O., district sales office from 607 Hanna Bldg. to 1235-36 Guardian Bldg., with Carl Dittmar as manager.

Brooklyn Color Works, 129-143 Cherry St., Brooklyn, N. Y., manufactures organic colors for rubber manufacturers. Joseph P. Muzzio is president; Charles H. Muzzio, secretary; and Baron Isaacs, treasurer. Branch offices are maintained by Fred H. Palmer, Jr., 750 Prospect Ave., Cleveland, O.; Fred L. Brooke, 228 N. LaSalle St., Chicago, Ill.; and Marshall Dill, 510 Montgomery St., San Francisco, Calif.

Southeastern Cottons, Inc., a textile merchandising organization, recently was formed to replace the Hunter Mfg. & Commission Co., 58-60 Worth St., New York, N. Y., where the new company will maintain its offices. It will be controlled by the member mills, which have been distributing through the Hunter firm. A technical department will be installed to increase standardization and to secure economy of production and improved quality through cooperation. Howard E. Coffin will head the directorate of the new organization; Frederick Huff Payne will be president; and Donald Comer, temporary Hunter president, will be a member of the executive committee with 10 other prominent mill executives.

PACIFIC COAST

W. C. Hendrie & Co., Inc., retailer of mechanicals and tires, 405 Towne Ave., Los Angeles, Calif., expects better business in the very near future, for the company salesmen report that conditions are more encouraging.

Rubbercraft Corp. of California, Ltd., 110-114 E. 17th St., Los Angeles, Calif., states that the rubber industry on the Pacific Coast continues to move along with the other manufacturing industries. The company recently completed in less than 48 hours an order of 8 alligators for a motion picture studio for a forthcoming native production. Rubbercraft Corp. has kept its factory at Torrance, Calif., operating a full 5-day week for the past year and a half. Charles N. Merralls, Rubbercraft president, has changed the sales policy on Stoner pneumatic decoys, which will be sold direct to the consumer, eliminating the middleman and cutting the selling price almost in half.

NEW JERSEY

Late Winter shows a decline in production of nearly all lines of mechanical goods and tires in New Jersey factories. Plants manufacturing druggists' sundries are running normally. Inclement weather has benefited rubber footwear factories, which have emptied their warehouses several times during the bad spells. A 5% cut in tire prices went into effect recently, which is expected to increase spring sales.

Pierce-Roberts Rubber Co., Trenton, reports that January was a very busy month, but that business declined during February. President Harry W. Roberts recently celebrated his forty-ninth birthday. He spent the day attending to business and in the evening entertained friends at his home. Mr. Roberts is active in civic affairs in Trenton.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, has been renamed vice president of the Trenton Board of Education.

Essex Rubber Co., Trenton, finds business holding up well for this season of the year; prospects for the spring are very encouraging.

William J. B. Stokes, president of the Joseph Stokes Rubber Co., Trenton, has gone to Bermuda with Mrs. Stokes and will remain there until the latter part of March. Milton H. Martindell, vice president and secretary of the company, will leave shortly for a trip along the Pacific Coast.

The Thermoid Company, Trenton, recently experienced a slight falling off of business because of the unsettled conditions in the automobile industry, but expects improvement in the early spring. The Woven Steel Hose & Rubber Co., controlled by Thermoid, is working full time.

Lambertville Rubber Co., Lambertville, is busy after a dull month. The stormy weather caused a run on the company's surplus stock; so working hours were increased.

Rubber Manufacturers' Association of New Jersey held its midwinter meeting on February 14 at the Trenton Club, Trenton. Following dinner, occurred a discussion on the rubber situation.

Mercer Rubber Co., Hamilton Square, finds business a little improved.

Murray Rubber Co., Trenton, has cut tires prices 5% to conform with the larger tire concerns. The company is not very busy now.

The Pocono Co., 1851 E. State St., Trenton, manufactures Swavel suede finished fabrics, Pocotop open car top fabrics, and Pocodeck closed car top fabrics. Neil E. Bowman is president; William H. King, vice president; H. B. Slusser, treasurer; and J. A. McQuillen, purchasing agent. The company reports declining business.

Pequanoc Rubber Co., manufacturer of reclaimed rubber, Butler, announces the following representatives: Western, Robert Knoblock, 2301 Lincoln Way West, Mishawaka, Ind.; Canadian, E. B. Ross, 1 Toronto St., Toronto, Canada.

MIDWEST

T. W. Morris, 6312 Winthrop Ave., Chicago, Ill., manufactures trimming machines for all types of rubber goods.

Copeman Laboratories Co., Inc., 212 Smith St., Flint, Mich., handles Flexo rubber ice cube trays. Executives include L. G. Copeman, president and purchasing agent; J. C. Lewis, vice president; and E. W. Atwood, secretary-treasurer.

Barco Mfg. Co., 1801-15 Winnemac Ave., Chicago, Ill., manufactures Barco joints. F. N. Bard is president and treasurer; C. L. Mellor, vice president and secretary; and W. F. Donaldson, purchasing agent.

The Falk Corp., Milwaukee, Wis., has appointed as vice president Edward P. Connell, who has been with the firm continuously since 1913. In 1924 he was made comptroller, which office he retains.

Crescent Dental Mfg. Co., 1839 S. Crawford Ave., Chicago, Ill., manufactures Crescent Brand rubber specialties for the dental trade. Company officers include Edward L. Chott, president; A. S. Chott, vice president; Hugo J. Chott, secretary; and V. E. Chott, purchasing agent.

Midwest Rubber Reclaiming Co., E. St. Louis, Ill., through President William Welch announces that throughout the plant, it is installing an automatic sprinkler system, which will be completed about March 15. Mr. Welch still feels hopeful for the long pull, notwithstanding the fact that the reclaiming industry is suffering seriously from the low state of the rubber industry generally and particularly because of the low price of crude rubber. Other Midwest company officers are S. G. Luther, vice president and general manager, and W. A. Hart, secretary-treasurer.

Dean Rubber Mfg. Co., 16th and Iron St., North Kansas City, Mo., manufactures Peacock Brand and Velvo-Silk prophylactic rubber goods. Executives include W. J. Dean, president; W. R. Adelsperger, vice president; J. B. Kassebaum, secretary-treasurer; and W. M. Briant, purchasing agent.

Frund Rubber Co., with factory in Racine, Wis., and principal office at 154 E. Erie St., Chicago, Ill., manufactures Frund's Plastic Rubber and Frund's Spreading Compound, a latex spreading compound for waterproof cloths as shower curtains, bags, etc. G. K. Franklin and H. B. Underwood are owners of the company.

Anderson-Prichard Refining Corp., with factory in Cyril and principal office in Oklahoma City, both in Okla., manufactures industrial naphthas including "Rub-Sol" and "Petrobenzol," rubber solvent gasolines; "Dependip," "Dipsol," and "Dryolene," dipped goods naphthas; and "Curesol," acid cure material for dipped rubber items. The company maintains branches in principal manufacturing cities. Officers are L. H. Prichard, president; J. Steve Anderson, vice president; and P. H. Anderson, secretary-treasurer.

President of Utility Manufacturing Co.

Like the story of a typical Alger hero reads the career of Edward Hutchens, president of the Utility Manufacturing Co., Cudahy, Wis., since 1916. He was born in Indiana on February 22, 1870. He attended elementary school, but left in 1882 when in the fourth grade. Although his formal education ended there, he never ceased in his efforts to educate himself.

Upon leaving school the lad labored in the Merritts Woolen Mills. Here was born in him the inclination for all things engineering to which he promptly devoted himself.

Mr. Hutchens, later working as a stationary engineer, set up the first engine and electric generator, a 4-light arc machine, that came to Indianapolis. In 1890 he designed, built, and operated a 100-ton absorption ice plant. When he joined Westinghouse, Church, Kerr & Co., engineers in New York, in 1897, he built the Indianapolis cold storage plant and the Manhattan Hotel power plant in New York. Besides, Mr. Hutchens erected the Westinghouse exhibit plant at the St. Louis World's Fair and built the first all-steam turbine plant in the United States at Hartford, Conn., as well as power plants for several of the early-day interurban electric lines.

Four years were spent in old Mexico erecting the Serra Madre Land & Lumber Co.'s power equipment. The year 1907 saw this much-traveled engineer back in Indianapolis rebuilding the G. & J. Tire plant. Four years later he rebuilt the Federal Rubber Mfg. Co. plant, Milwaukee, Wis., and then became its supervising engineer.

In 1915, Mr. Hutchens, as a consulting engineer, opened his own office. He erected the Gillette Rubber Co. plant, Eau Claire, Wis., and enlarged and planned the future of the Mansfield Tire & Rubber Co. extensions, Mansfield, O. Moreover he built and furnished plans and specifications for rubber plants in Australia, Tasmania, South America, and the United States. He organized the Utility Manufacturing Co. in 1916 to build special machinery for the rubber trade. This enterprising executive also has invented the crimper method of flipping beads, center lock vulcanizers, and over 50 other special devices, and now has many patents pending.

He has been a member of the National Association of Stationary Engineers since 1887 and a member of the American Society of Mechanical Engineers since 1913. His name appears, too, on the rosters of the Odd Fellows, several Masonic bodies, the Professional Club, and the Engineers Forum.

His address is 2935 S. Superior St., Milwaukee, Wis.

NEW ENGLAND

Wellman Co., 58 Swan St., Medford, Mass., makes rubber sole cutters. H. P. Ballard is president and treasurer; H. S. Marlor, vice president; and Eric Burkman, secretary.

Gould Golf Ball Co., Inc., moved its factory from 429 Washington St., Lynn, to 522-528 Main St., Wakefield, both in Mass., to take care of the ever-increasing demands of its customers.

Goodyear Rubber Sundries, Inc., 75 Daggett St., New Haven, Conn., manufactures rubber sundries. James A. Murray is president and treasurer; James A. Murray, Jr., vice president and secretary; and Theodore Benson, purchasing agent.

W. E. Phinney, 592 Beacon St., Boston, Mass., manufacturers' agent, recently took over the representation of Van Cleef Bros., Chicago, Ill., on their Dutch Brand rubber and chemical products in all the New England states. The new appointment was made by Felix Van Cleef, who has been spending considerable time in New England with Mr. Phinney.

National India Rubber Co., a subsidiary of the United States Rubber Co., Eagle St., Providence. Two men were instantly killed, and 2 others seriously injured early February 3, when a terrific explosion of its 2,000-gallon tank of gasoline was followed by fire, wrecking the cooling plant, a 1½ story brick building where golf ball coverings were made. Damage is estimated at $75,000.

Pensioners of the National India Rubber Co., Bristol, received word recently that effective February 28 their monthly pensions would be cut 15%. A year ago the pensions were cut 10%.

The Ninigret Mill, Central St., Pawtucket, a non-operating tire fabric subsidiary of the Fisk Rubber Co. of Chicago, recently had entered against it a foreclosure sale by a decree of Federal Judge Lowell at Boston, Mass.

The Atlantic Tubing Co., 1756 Cranston St., Cranston, has given a contract for the erection of a concrete block storage building at its plant to cost about $2,500.

Collyer Insulated Wire Co., Pawtucket, has announced the election of Frank Crook to its directorate, making 7 instead of 6 members on the board. The following directors were reelected for the coming year: H. W. Smith, V. C. B. Wetmore, V. Cross, George H. Lumb, P. H. Lewis, and I. C. Moeller. At a subsequent meeting of the directorate the following officers were reelected: president, Mr. Smith; vice president, Mr. Wetmore; secretary-treasurer, Mr. Moeller; and assistant secretary-treasurer, H. W. Emery.

Acushnet Process Co., New Bedford, Mass., manufactures Whaler, Gyro, Eureka, and The Great Scot golf balls, all of which are twice tested by X-ray to assure accurate spherical cores, perfectly centered.

FINANCIAL

General Tire & Rubber Co.

The General Tire & Rubber Co., at the annual meeting, January 17, reported an operating profit of $1,075,546.89 in 1932, after depreciation and interest. Reduction of inventory and commitments in raw materials cut down the company's net profit for the year, after all charges, to $202,353.79. At the end of 1932, the company's earned surplus was $3,329,410.44 as compared with $3,228,246.65 at the end of 1931.

Sales for the past year amounted to $16,679,000, a reduction of less than 20% in dollar volume from 1931, due largely to lower prevailing prices of merchandise. Operating profit in 1932, before depreciation, interest, and special reserves was $1,448,872.70 or more than twice the 1931 figure of $587,187.65.

The ratio of current assets to current liabilities was increased from 5 to 1 in 1931 to more than 7 to 1 in 1932.

The company has no bonded indebtedness of any kind, and the amount of preferred stock outstanding was reduced during 1932 from $3,228,200 to $3,161,500. Notes payable to banks were reduced in 1932 from $1,000,000 to $350,000. At the end of 1932 the company's balance of cash on hand or in banks was about twice as much as it owed.

Goodyear Tire & Rubber

Consolidated net sales of the Goodyear Tire & Rubber Co. for 1932 were $109,051,757. Consolidated earnings, after deducting $10,103,041 to provide for depreciation of plant buildings, machinery and equipment; after all taxes and after provision of $6,475,327 to adjust inventories, amounted to $3,167,867. Further deductions for interest charges on funded debt and for adjustment of minority interest in subsidiary companies, resulted in a final net loss of $850,394, charged to earned surplus account.

The company has maintained its policy with regard to provision for depreciation reserve which again has substantially exceeded the year's capital expenditures. The net consolidated property account is now $88,561,041 as against $95,450,522 a year ago.

Cash and government securities amount to $50,073,277, government securities being carried at the lower of cost or market. The company has no bank indebtedness and its ratio of current assets to current liabilities is 13 to 1. Net working capital increased during the year from $89,259,858 to $91,565,211.

All sinking fund requirements have been met, the operation of the bond purchase fund resulting in the retirement of $834,000 first mortgage bonds during the year. Dividends on first preferred stock were paid in full.

Capital surplus account has been reduced $823,940, adjustments having been made to reduce book values of subsidiary plantation companies' properties at home and abroad to values more consistent with current conditions.

The Goodyear directorate, at a regular monthly meeting, in view of present unsettled conditions generally, decided to reduce the amount of the dividend on first preferred stock payable April 1, 1933, to 50¢ per share. The remainder of the dividend is cumulative and may be paid at any time conditions justify.

Thermoid Company

The Thermoid Company and wholly owned subsidiaries reported for 1932, a net loss after depreciation, interest, and other charges, of $199,868, contrasted with a profit of $163,413 in 1931. Current assets as of December 31, 1932, including $740,570 cash and marketable securities, were $1,865,604, and current liabilities were $281,275, compared with cash of $603,718, current assets of $2,115,847, and current liabilities of $333,369 at the end of preceding year.

Raybestos-Manhattan, Inc.

During the year 1932 Raybestos-Manhattan, Inc., incurred a net loss of $457,167.39, after provisions of $555,647.66 for depreciation. The company's balance sheet at December 31, 1932, showed current assets of $6,277,670.73, equivalent to 20 times the current liabilities of $312,630.07. There were no bank loans, bonds, or other funded indebtedness.

The common stock is the company's only capital obligation outstanding. The net current assets represented $9.21 per share, and the cash and cash funds of $3,325,067.19, were equivalent to $5.12 per share, issued and outstanding in the hands of the public.

The directors declared a dividend of 15¢ per share, payable March 15, 1933, to stockholders of record at the close of business February 28, 1933.

The B. F. Goodrich Co.

The following preliminary statement was issued after the regular meeting of the board of directors of The B. F. Goodrich Co., held February 14, 1933.

The accounts for the fiscal year ended December 31, 1932, show consolidated sales of $74,501,803, compared with $115,165,147 in the previous year. Excluding sales by the Hood Rubber Co., Inc., in 1931, because they were not included in 1932, the decrease amounted to $29,645,836, or 28.4%.

Operations of the company after deducting depreciation charges, interest charges, inventory losses, losses in foreign exchange, a write-down of investment in Hood Rubber Co., Inc., to book value December 31, 1932, and after giving effect to a profit on bonds and debentures of the company purchased during the year, resulted in a net loss of $6,582,140 during the year.

Raw materials on hand and on commitment and material content of unfinished and finished goods were valued at the lower of cost or market prices at December 31, 1932.

The company continues in a strong financial position. Cash in banks and on hand and United States Government securities amounted to $16,511,208. Total current assets amounted to $49,027,155 with current liabilities of $5,331,857, a ratio of 9.2 to 1.

OBITUARY

Veteran Rubber Man

EMMETT A. SAUNDERS, president for 26 years, until 1930, of the Mishawaka Rubber & Woolen Mfg. Co., South Bend, Ind., died January 27 in New York, N. Y. His connection with rubber manufacturing began at Naugatuck, Conn., when he was 12, and covered virtually a half century of activity in the shoe division of the industry. He invented various improvements in rubber, boots, and shoes and was notably successful as plant manager successively of the Wales-Goodyear Rubber Co.; the L. Candee Rubber Co.; the United States Rubber Co.; and the Mishawaka Rubber & Woolen Mfg. Co. The success of the latter company and the high standing of its products can be credited largely to the abilities of Mr. Saunders as a practical rubber manufacturer and business manager. He organized its extensive rubber department in 1898.

He leaves a widow.

Firestone Traffic Manager

AFTER an illness of 9 weeks, suffering from heart disease and complications, Edward C. Knox, traffic manager of the Firestone Tire & Rubber Co., Akron, O., since March 3, 1909, died at his home on February 15. He was born in Holmesville, O., August 19, 1876, and attended the local public and high schools. Mr. Knox was employed by the Pennsylvania Railroad at Akron from 1907 to 1909, and prior to joining Firestone he had studied and practiced law.

The deceased belonged to the Traffic Study Club, New York, N. Y.; Traffic Committee, Akron Chamber of Commerce; Akron Bar Association; and Akron Lodge No. 83, F. & A. M.

Funeral services were held February 17. Interment was in Glendale Cemetery.

Surviving are Mrs. Knox, 2 sons, and 2 daughters.

Son of a Pioneer

ALFRED H. SCHLESINGER, 65, died on February 18 at his home in College Point, L. I. He was the son of Auguste D. Schlesinger, the veteran rubber man who became connected with the Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn., in 1847, and worked for the Beaver Dam Co., in Beacon Falls, Conn., and Poppenhusen & Koenig and India Rubber Comb Co., both of College

(*Continued on page* 50)

Rubber Industry in Europe

GREAT BRITAIN

1932 Rubber Industry

Except for increased exports of automobile tires and tubes, waste and reclaimed rubber, and rubber substitute, British rubber imports and exports showed somewhat severe declines during 1932, the Board of Trade figures indicate.

Imports of crude rubber in 1932 were 2,124,002 centals of 100 pounds against 2,839,403 in 1931 and 3,910,628 centals in 1930. Almost half the 1932 total was re-exported, leaving 1,123,713 centals (50,161 tons) for British consumption. This amount, however, was supplemented by stocks out of public warehouses so that actually British crude rubber consumption in 1932 totaled 84,702 tons against 75,429 tons in 1931. Imports of balata and gutta percha declined in similar proportion, having been 2,733,200 pounds in 1932 against 3,350,400 pounds in 1931, and 4,607,300 pounds in 1930; while imports of waste and reclaimed rubber dropped from 7,697,700 in 1931 to 2,772,500 pounds, but exports of the latter rose from 15,810,500 pounds in 1931 to 21,319,200 pounds in 1932 and of rubber substitute from 474,600 to 641,800 pounds.

The value of automobile tires entering the country in 1932 declined again by almost 50%; exports of these goods improved, but the business in other tires continued to decline as follows:

Imports Pneumatic covers	1930 £	1931 £	1932 £
Automobiles	222,700	126,584	67,164
Motor cycles ...	16,132	3,900	2,532
Cycles	89,838	90,247	7,601
Inner tubes	63,457	75,626	10,083
Solid tires	41,908	42,358	29,878
Exports			
Pneumatic covers			
Automobiles	3,427,366	2,455,566	2,640,316
Motor cycle	97,026	102,434	52,400
Cycles	318,346	288,144	236,470
Inner tubes	544,100	336,522	340,339
Solid tires	88,284	53,398	39,621

England's own colonies are her best customers for tires, New Zealand, whose purchases of British tires have almost doubled since 1930, leading all; next come British South Africa, India, and the Irish Free State, although shipments to the last 2 have steadily declined since 1930. Of the other countries Netherlands is first, then Denmark, Argentina, and Sweden. The last 2 have cut their purchases of British tires to almost 1/3 the 1930 value.

In view of the agitation in connection with footwear imports, it is interesting to note that these show a progressive decline, having been 1,244,462 dozen pairs, value £1,718,726, in 1930; 1,172,504 dozen pairs, value £1,538,828, in 1931; and 991,296 dozen pairs, value £894,283, in 1932. Exports of footwear at 153,655 dozen pairs, value £191,965, were disappointing when compared with 168,229 dozen pairs, value £233,885, in 1931 and 255,196 dozen pairs, value £380,042, in 1930. Exports of proofed apparel fell from a value of £1,037,904 in 1930 to £790,018 in 1931 and again to £643,176 in 1932.

The shipments abroad of balata and other kinds of belting declined from a value of £286,686 to £250,238. The business in insulated cables fell considerably in 1932 when imports were only £304,427 against £823,690 in 1931 and £964,915 in 1930 while exports were £1,515,508 against £2,054,784 in 1931 and £4,546,125 in 1930. Imports of other rubber goods declined from £2,208,564 in 1930 and £1,891,022 in 1931 to £891,974 in 1932. Exports suffered less and were £1,751,901 against £1,903,297 and £2,449,490 in 1931 and 1932 respectively.

Bata Shoe Factory

The much discussed shoe factories at East Tilbury are finally under construction. A site of 600 acres has been acquired on which 2 factories are to be built to begin with. The first of these is expected to be ready for operations in May. Workers trained in the Bata factories will be employed to work 9½ hours a day for 5 days a week on the terms customary in all Bata works, that is piece-work rates plus a share in the profits. Each department in a Bata factory is treated as a separate commercial unit and buys from the preceding department and sells to the next, each department keeping its own accounts. The profits of a department are figured out weekly, and workers receive half their share in cash while the balance is reinvested in the business in their behalf at 10% interest. Workers at the new factories will live on the estate in specially built houses, each having ½ acre of land for the growing of vegetables.

British Notes

British rubber factories are in an exceptionally favorable position to take advantage of improving conditions, finds Harry J. Smith, export manager of the National Rubber Machinery Co., Akron, O., U. S. A., who has been visiting England.

Hecht, Levis & Kahn, Ltd., 17-18 St. Dunstan's Hill, London, E.C.3, announced that Charles E. Fletcher joined the board of directors on February 1.

A patented rubber solid tire for milk churns will be produced by Silent Milk Churns, Ltd., Derby, a new company capitalized at £1,500.

The Research Association of British Rubber Manufacturers, it is learned, are in financial difficulties so that unless it receives proper support as that provided by the Rubber Industry Bill, now before the Parliament, the organization will have to be dissolved and the scientific work at Croydon discontinued.

A. Schrader's Son, of Canada, will soon be producing tire valves in its newly acquired factory in Birmingham.

Durable rubber finished in a milled pattern and lined with a strong material which absorbs perspiration, forms the uppers in a new moisture-proof golf shoe made by the Dunlop Rubber Co., Ltd. The studded soles and heels are also waterproof and flexible.

Universal Rubber Paviors, Ltd., will lay 300 to 400 square yards of Gaisman blocks in the Mersey Tunnel.

According to a patent taken out by Rainex, Ltd., and L. Kay, of Manchester, a waterproof fabric designed for interlinings for apparel is made by printing a pattern or wording on one surface, which is then coated with a transparent rubber compound and glazed by varnishing. To the other side of the fabric is applied a semi-transparent or opaque colored rubber compound or a compound of rubber and powdered metal or mica, which is given a dull finish.

Miocarta Sideplates

The excellent results obtained in the years that Miocarta Cloth sideplates have been used on its own wet-mills have led the Ioco Rubber & Waterproofing Co. to market this material for that purpose. Sideplates are usually of iron or wood, but besides the disadvantage of the iron rusting, risk exists also of fires due to the friction between rollers and plates; while though wooden plates have less fire hazard, they wear out and have to be constantly replaced. With Miocarta sideplates, it is claimed, fire risks are reduced to a minimum, and so far replacements have not been found necessary.

Miocarta Cloth is a bakelite product. The thick sheets have an average tensile strength of 10,000 pounds per square inch, which can be increased to 16,000 pounds. The average compressive strength along the laminae is 26,400 pounds per square inch, and perpendicular to the laminae, 40,500 pounds. It has a Brinell hardness of 41, and its modulus of elasticity is 1,157,000 pounds per square inch tensile and 1,035,000 pounds per square inch transverse. Besides these exceptional mechanical properties it absorbs practically no oil or moisture whatever and resists steam.

Miocarta Cloth has a specific gravity of 1.3 to 1.4 and is usually supplied in sheets 4 by 2 feet and about ⅜-inch thick. Though the initial cost is higher, sideplates of this material are much more economical in the end.

GERMANY

New Processes

The methods for creaming latex with pectins, as patented in America, have so far not proved suitable. Not only do they require heating the latex and adding large amounts of pectin, but the separation into an upper layer rich in rubber and a lower layer poor in rubber is not advantageous since too much rubber is still retained in the lower layer to be considered economical.

These disadvantages, it is claimed, are eliminated by the process for fractional creaming with pectin substances recently patented by the Deutsche Pektin-Gesellschaft m. b. H., Frankfurt a. M., in which a very small amount of pectin is first added to the latex without heating, causing the greater part of the rubber to collect to the top. This rich layer is removed and a still smaller amount of pectin is added to the remainder, and the process of creaming is renewed. The procedure of adding decreasing quantities of pectin to the skimmed portion and removing the rich top layer is repeated until the remaining serum is clear and quite free of rubber.

Artificial resins, greatly resembling the best rubber resins, are obtained when urea and formaldehyde are added to chlorinated natural, reclaimed, or more or less polymerized synthetic rubber, alone or mixed with terpene resins or resin oils. These new resins are extremely resistant to water, have good insulating powers, give a dense film, and are soluble in turpentine and other hydrocarbons. By heating such resins, linseed oil can be added, and the resultant products can be used as coating or as adhesive. By means of increased pressure or the colloid mill, the products can also be readily dispersed in hydrocarbons in which they are not directly soluble.

Exhibitions

The date for the Achema VII (Exhibition of Chemical Plant), to have been held at Cologne during 1933, has finally been set for May 18 to 27, 1934, to suit chemical apparatus manufacturers who are to participate.

The decision does not apply to the rubber exhibition of the Deutsche Kautschuk Gesellschaft to have been held in conjunction with the Achema VII, and the former will take place in June, 1933, as originally planned. Preparations for the rubber exhibition have begun, and as far as can be judged at this early stage the exhibition promises to be one of exceptional interest both to the layman and the rubber man. The history of the development of rubber production and manufacture will be shown, starting with the earliest primitive methods of the natives of Brazil. A special attraction will show the present status of the rubber industry, including a display of all rubber goods for daily use. It is also planned to illustrate the correct method of treating and caring for rubber goods. Finally the various methods employed for examining, testing, etc., of rubber are to be demonstrated in a scientific section.

German Notes

According to the quarterly report of the Chambers of Commerce and Industry, Hannover, business in the German rubber industry has been improving since last September and factories are engaging additional workers.

The Klingerit Convention, it is announced, has been renewed. In the 5 years since its formation, largely owing to the efforts of the Rubber, Asbestos, and Technical Goods Dealers' Association, the Convention has greatly assisted in putting the business in *It-sheets* on a commercially sound basis.

Rheinische Gummi & Zelluloidfabrik, Mannheim-Neckarau, capitalized at 4,006,000 marks, stock chiefly held by the I. G. Farbenindustrie A. G., reports a loss of 1,960,298 marks against a loss of 702,630 marks the year before.

Thiokol

A letter signed Jean Baer, chemist, of Basle, Switzerland, appears in a recent issue of *Kunststoffe* in which he claims that the newly patented American synthetic rubber product known as Thiokol is his invention. He asserts that in 1926 he entered his invention in his own name and under the title of "Method for Producing an Elastic Rubber-like Body" in all countries and has obtained patents for the process in several countries.

Turkey

The importance of Turkey as a possible rubber footwear manufacturing center has apparently just been realized, for within a comparatively short time 3 companies have been formed to produce rubber shoes. The first and most important of these firms is the Gislavet Ltd., Sirketi, a branch of the Svenska Gummifabriks A. B., Gislavet, Sweden, and part of the capital is in Swedish hands, the rest Turkish. The firm will manufacture other rubber goods besides footwear, but meantime it is producing 500 to 800 pairs of shoes daily and, when working to capacity, should be able to supply all Turkey's needs in this respect. The parent company is one of the smaller Swedish rubber footwear concerns, but it is said to have the backing of the Ko-Operative Forbundet, Stockholm, a financially powerful cooperative society. Apparently the Turkish branch is intended to supply not only local demands, but also the Near Eastern markets.

The second company, Fabrique de Caoutchouc d'Istamboul Behor Danon and Behor Peres, is constructing a factory at Jedikule. The third, a much smaller concern, is already producing shoes for sportwear in Stamboul.

Czechoslovakia

The Ministry of the Interior has approved the establishment of the Pneu Michelin A. G., to produce all kinds of rubber goods. The firm, capitalized at 10,000,000 crowns, divided into 10,000 shares of 1,000 crowns each, will have its headquarters in Prague.

Russia

Crude rubber imports into Russia during the first 9 months of 1932 came to 22,371 tons against 19,706 tons in 1931. The total for the entire year is estimated at 33,000 tons against 31,000 in 1931, 16,671 tons in 1930, and 12,702 tons in 1929. Russia's rubber requirements for 1933 have been fixed at 45,000 tons, according to the second 5-year plan.

France

Anciens Etablissements Torrilhon, which showed a deficit of 3,611,000 francs in 1930-31 reports a further loss of 3,000,000 francs over 1931-32. It was decided to reduce the capital from 12,000,000 to 4,000,000 francs and then to increase it again by successive stages until it reached to 15,000,000 francs.

Caoutchouc Reno booked a loss of 31,175 francs, which has to be added to a deficit of 3,058,518 francs.

Etablissements Fournier, Ostertag & Le Boulanger closed its accounts over the year ended June 30, 1932, with a net profit of 778,636 francs against profits of 2,555,603 francs the year before. (Franc = $0.0392 U. S. equivalent.)

Electrofil, Paris, a new firm established by Swiss interests, capitalized at 1,000,000 francs, will manufacture all kinds of electric wires and cables.

Italy

The Societa Italiana Industria Gomma e Hutchinson, Milan, booked net profits of 2,610,000 lire on a capital of 10,500,000 lire. A dividend of 12.50 lire is being paid on the 75 lire shares. (Lira = $0.0526 U. S. equivalent.)

All rubber belts, conveyers, rings, cords, buffer blocks, without any insertions whatever, but having the necessary degree of resistance to stretching, are made by cementing one or more rubber layers on to a permanently stretched rubber core. The individual layers are prevulcanized and cemented to the stretched core with self-curing rubber cement; then the whole is given a final cure. The effect of the method, which is patented by Societa Italiana Pirelli, Milan, it is claimed, is to secure a high degree of rigidity in some layers, while at the same time other layers will show better resistance to perforation, slip, and abrasion.

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Future Rubber Yields

Future rubber yields from high grade buddings and trees from selected seed are enthusiastically discussed in 2 successive issues of the *Algemeen Landbouwweekblad.* The basis of data from various sources shows that yields of 1,000 pounds per acre and more are well on the way toward realization. Dr. Grantham is quoted as having said at the end of 1931 that yields of the oldest commercial plantations of mixed H. A. P. M. clones were 1,400 pounds per acre. Then the A. V. R. O. S. experiment station, at a conservative estimate puts the future yields of the newest clones at 1,200 to 1,400 kilograms (kgs.) per hectare (ha.), although 2,000 kgs. per ha. for the very best clones is not unusual. (Kilogram = 2.2046 pounds U. S. equivalent.) At the A. V. R. O. S. Selection Garden Soengei Pantjoer yields from 58 trees of cross 157 by 164 average 9.11 kgs. per tree in the fifth tapping year so that they are expected to produce at the rate of at least 1,360 kgs. per ha. (Hectare = 2.471 acres U. S. equivalent.)

Tables are given indicating that the average actual yields of the 6 best clones have increased regularly from 5.3 kgs. per tree per annum, when the trees were in their seventh year, to 11.2 kgs. in their tenth and 13.2 kgs. in their twelfth year; while the 9 best Prang Besar clones average 9.3 kgs. per tree per annum in the tenth year. The figures are the more interesting since they cover a fair number of trees; the Prang Besar figures, for instance, refer to 1,408 trees while the other yields were averaged by 515, 412, and 10 trees respectively. On the basis of these data it is figured that with 500 buddings of the 6 best clones planted per hectare and subsequently thinned out to 300 per hectare in the sixth year and to 200 in the fifteenth year, the yield per hectare will be not less than 2,400 kgs. per hectare in the fifteenth year.

Buddings and Manuring

One of the advantages promised by planting high yielding trees has been the possibility of greatly lowering costs. But a well-known estate manager on the East Coast of Sumatra, having misgivings, asked the General Experiment Station of the A. V. R. O. S. whether buddings assimilated more food material from the soil than ordinary seedlings; and if so, would heavy manuring be imperative thus increasing proportionately the cost of buddings.

However, the station dissipated these fears, explaining, according to the *Algemeen Landbouwweekblad,* that since the main constituent of latex other than water is rubber, no food elements but water are withdrawn from the soil for pure rubber. Besides pure rubber and water latex also contains sugars, salts, and nitrogenous substances so that here again no nutritive elements are removed from the soil. Normal soils show no lack of most of the mineral substances, but some possibility exists that a shortage might occur in the case of potash. However the station believes that a high yielding budded plantation will not require very much more manuring than the present plantations of seedlings.

Transporting Latex

One cost item, however, would definitely increase on high yielding budded estates: the cost of transporting latex from field to factory. At present the tapper brings in his own latex, but with greatly increased yields he could no longer do so; consequently, the daily output would have to be taken to the factory by trucks or by rail. The costs of this service, including allowance for depreciation, work out at 1 guilder cent per kg. so that the cost per kg. of rubber would be increased that much.

Taking everything into consideration, the A. V. R. O. S. calculates that if at present the f.o.b. cost of a kg. of rubber is 0.40 guilder for an estate with an annual output of 500 kgs. per ha., then the costs, when 1,000 kgs. are produced, would be 0.24 guilders per kg. and 0.155 guilders per kg. when yields are 2,000 kgs. per ha. (Guilder = $0.402 U. S. equivalent.)

Progress in Sumatra

The annual report of the Director of the Algemeen Proefstation of the A. V. R. O. S. covering the period July 1, 1931, to June 30, 1932, shows that more than 3 times as much sheet as crepe was produced in the East Coast of Sumatra; 209 estates prepared 35,835,984 kgs. of sheets more than 3 mm. thick, 11,576,301 kgs. crepe, and 1,842,991 kgs. A. V. R. O. S. sheets. The latter are specially made, thin sheets 2.0 to 2.8 mm. thick. Under favorable circumstances sheets 2.4 mm. thick are smoked in 36 hours at properly maintained temperatures averaging 45° C. By the end of 1931, 10 factories were preparing this type of rubber, and the interest in it is said to be increasing. The A. V. R. O. S. has obtained a patent for this process so that only members of the Association are free to make these sheets. A new factory with a daily capacity of 2,000 to 3,000 kgs. of these thin sheets was constructed in the year under review, and it is claimed that by taking into consideration the type of sheets to be made, a saving of 20% on the construction costs was effected.

Sole crepe is made on 40 estates in East Coast Sumatra, in thicknesses varying from 1/16- to 3/8-inch. The Experiment Station gave advice on preparing very white sole crepe with a special tread design and also sole rubber with fabric insertions.

Many estates are adopting the ABC tapping system and some report very good yields, but others, especially a few high yielding plantations, are disappointed. At first this led to the conclusion that high yielding plantations do not react to a prolonged resting period. But later experience suggested that the true explanation is that the tappers could not carry the increased amount of latex and therefore tapped in a way to maintain the crop at a level more convenient for them to handle. This explanation finds support in an experiment by Jhr. van Suchtelen, who for a few days had the latex taken from the field to the factory by narrow gage rail, when the daily output per tapper spurted from 11.2 kgs. dry to 18.6 kgs. dry.

Where yields are over 650 kgs. per ha., the report concludes, planters must provide some facility for transporting the latex.

Rubber Forestry

The experiment in so-called artificial rubber forestry conducted on Moemboel Estate[1] continues to be the subject of more or less favorable discussion. It will be remembered that in this case, leguminous covers, instead of natural covers, were allowed to grow undisturbed for a period of years, with remarkably good results. The criticism has been offered, however, that forestry makes supervision difficult and that an overgrown garden takes a long time to dry during the rainy season, thus delaying tapping and at the same time favoring stripe canker.

Replying to these critics, the *Soerab. Handelsblad* states that its investigator found 30 and more tapping panels that were visible at a time; so the case for supervision is by no means so unfavorable. While admitting the drawbacks of forestry conditions in the rainy season, the writer points out that morning rains on Moemboel are rare; and whereas stripe canker had formerly been very prevalent, the estate is comparatively free of the disease now.

[1] India Rubber World, Sept. 1, 1932, p. 55.

Sulphur Dusting

In Java, only sulphur dusting can preserve the foliage of rubber trees from the leaf disease *Oidium Heveae.* The planters there are seriously concerned because the low price of rubber offers no prospect of their being able to afford the cost of this treatment; for trees with poor foliage gradually die. Leaf fungus is now making grave headway in Malaya and Ceylon, and the position regarding its treatment is exactly comparable to that in Java. What are the planters to do?

MALAYA

Sulphuric Acid as a Coagulant

Interest in the use of sulphuric acid as a coagulant for latex is revived by J. L. Wiltshire's report in the *Journal of the Rubber Research Institute*, Vol. 4., No. 2. This acid was first suggested as a makeshift during the war when supplies of acetic, then the chief coagulant, were not available. Its use, however, was soon discouraged because of its adverse effect on quality and cure. Besides, its corrosive properties made it unpopular with planters. To be sure some of the earlier investigators showed that sulphuric acid was perfectly satisfactory as regards the actual coagulation, but was harmful to the rubber if used in excessive quantities and especially when a large proportion of the acid was retained in the rubber. If used in minimum quantities and removed as completely as possible, the harmful effects were negligible.

Today when sulphuric acid is considerably cheaper than either acetic or formic acid, it seemed worthwhile for Mr. Wiltshire to confirm the above conclusions, and his experiments show that sulphuric acid gives satisfactory coagulation at approximately ½ the cost of formic acid and 1/3 that of acetic acid. It is not harmful if used in the smallest possible quantity and the sheet or crepe is washed with plenty of water during machining. Finally with proper caution danger of personal injury could be practically eliminated.

Estates desiring to introduce the use of sulphuric acid, said Mr. Wiltshire, would have to experiment for a week or 2 until they found the most satisfactory quantity to use. For machining on the day after coagulation, about one fluid ounce of acid to 20 pounds of dry rubber is recommended to start with, and one fluid ounce to 26 pounds of dry rubber if the coagulum is machined the same day. Good quality commercial acid should be used of specific gravity 1.84 (sometimes sold as 168° Twaddell).

Some brokers and consumers are still opposed to sulphuric acid sheets, and the warning against its use issued by The Rubber Growers' Association in its Bulletin of August, 1926, is quoted, although several estates for years have been selling sheet made with sulphuric acid at top prices. In response Mr. Wiltshire stresses the changes that have occurred in the meantime. Thus in August, 1926, rubber was selling at 1s. 6d. per lb. while in 1932 the price was around 2d.; on the other hand the acid costs are not very different from those in 1926 so that the saving to be effected by using sulphuric acid represents a much larger percentage of the cost of production and also of the margin between cost and selling price. As to the variability of plantation rubber, this is still considerable even on estates where only formic acid is used. With sufficient care, he concludes, it is possible to produce a good quality rubber when sulphuric acid is used.

Fever and Forestry

The *Straits Times* touches on the possibility that the new forestry trend in rubber planting may increase the danger from so-called Japanese river fever. The disease, akin to typhus, is carried by a mite which in turn is carried by rats, and the danger is greatest in swampy ground and undergrowth and similar places where rats are likely to breed.

Discussion of the disease has been called forth by the fact that a European recently succumbed to it, and the special reference to rubber forestry is prompted by the recollection that one of the worst outbreaks of the disease in these parts occurred in 1925 on a group of estates in Sumatra belonging to the Goodyear company. Owing to the slump the estates had not been properly weeded, a condition which favored the development of the disease.

Malayan Notes

A reenforced, compounded rubber molded bucket has been patented and marketed by E. A. Hodges, of the Kinta Rubber Works, Ipoh. The Kinta Sanitary Board, it is reported, having tried these buckets for the past 8 months and having found them durable and economical, will therefore continue to use them.

It has been suggested the F. M. S. Railways Co. reduce noise and vibration of trains by insulating rails and wheels with rubber. Unfortunately the time is not suitable for making experiments like this. Incidentally, the railway company stated that the use of rubber scrap to fire locomotives with will not be further tested since it has been found cheaper to use old ties.

The government has recommended to the Secretary of State for Colonies that a commission be appointed to inquire into the affairs of the Rubber Research Institute.

The Pataling Rubber Estates plans to take over the Pernambang Rubber Estates.

A bill was recently passed in Kedah to encourage small holders to abandon rubber for more suitable crops. The Small Rubber Holders (Reduction of Rent) Enactment, as it is called, provides for reduced rents on small holdings provided they grow no rubber from now on.

Popularize the Raincoat

The *Malayan Tin & Rubber Journal*, discussing the editorial on popularizing the raincoat which appeared in INDIA RUBBER WORLD[1] says a colossal market exists in Asia for cheap and reliable raincoats, but American business men do not appear to have made any effort to exploit it. Nor, so far as is known, have British raincoat makers made the attempt. At present they send a very good article, but it is quite beyond the means of the average Oriental in Asiatic towns, compelled to go out in all weathers.

"A light, really cheap raincoat would, for instance, have a wonderful sale in Malaya," believes the journal.

[1]Nov. 1, 1932, p. 42.

OBITUARY

(*Continued from page 46*)

Point. When the latter company was merged with Butler Hard Rubber Co. and the Goodrich Hard Rubber Co., in 1898, as the American Hard Rubber Co., he was made general superintendent, serving until 1905 when he retired. His death occurred in 1911.

Alfred H. succeeded his father as superintendent of the American Hard Rubber Co. and continued until October, 1911, when he retired from the rubber business and devoted his time to banking and other interests. At his death Mr. Schlesinger was president of the College Point Savings Bank.

Jesse C. Hambly

JESSE C. HAMBLY, for the past 15 years assistant secretary and assistant treasurer of the New England Butt Co., Providence, R. I., died in the Homeopathic Hospital there, February 5, after a short illness. He was prominently identified with the Masons, Odd Fellows, and Elks. He is survived by his widow and 2 brothers.

Kem No. 222

Kem No. 222 is a standardized, uniform white powder of purely vegetable origin. It is neutral, non-toxic, and available as a regular supply in large quantities. The diversity of its industrial applications is of exceptional range and includes its use as a good thickener for latex without coagulating effect.

Mexico

Compañía Hulera Industrial Mexicana, S. A., Bahía Ballenas No. 2 (Colonia Verónica), manufactures footwear, rubberized fabrics for raincoats, hospital sheeting, curtains, auto tops, matting, tubes, tires for toys, etc. Officers and owners are Angel Moreno, president; Francisco Torres A., vice president, treasurer, and purchasing agent; and Francisco Coudurier, secretary.

H. Rau, with plantation at Las Palmas and principal office at Ave. México 194, México D. F., deals in hevea brasiliensis, para rubber, sheets, castillon elástica, and panama rubber.

Compañía Manufacturera de Artefactos de Hule "Euzkadi," S. A., Calle M. Cervantes Saavedra, Colonia Verónica, Tacuba, makes Paragon rubber heels and Euzkadi tennis shoes, tubes, tires, tiling, hose, tire repair stocks, nipples, gaskets, rubber bands, and erasers. Company executives include Fernando Rodríguez, president; José Larrea, vice president; Enrique de Zunzunegui, secretary; Angel Urraza, treasurer; and Roberto Luengo, purchasing agent.

Patents and Trade Marks

MACHINERY

United States

1,892,942. **Vulcanizing Press.** J. R. Gammeter, assignor to National Rubber Machinery Co., both of Akron, O.

1,893,005. **Centrifugal Separator Bowl.** G. J. Strezynski, Poughkeepsie, assignor to De Laval Separator Co., New York, both in N. Y.

1,893,234. **Plastic Material Press.** J. L. Hunter, assignor to Ahlbell Battery Container Corp., Waukegan, Ill.

1,893,424. **Buffer.** R. Luzardo, New York, N. Y.

1,893,465. **Rubber Thread Apparatus.** F. Cremer, Englewood, N. J., assignor to Xetal Corp., New York, N. Y.

1,893,762. **Vulcanizing Apparatus.** B. De Mattia, Passaic, N. J.

1,894,017. **Vulcanizer.** H. C. Bostwick, assignor to Akron Standard Mold Co., both of Akron, O.

1,894,347. **Tire Retreader.** C. H. Dacon and V. Stults, assignors to St. Louis Tire Retreading Machine Co., all of St. Louis, Mo.

1,894,618. **Rubber Mill Cooler.** J. M. King, Detroit, Mich.

1,895,118. **Continuous Electric Measuring Gage.** A. Allen, Winchester, assignor, by mesne assignments, to Atlantic Precision Instrument Co., Boston, both in Mass.

1,895,274. **Bias Cutter.** H. S. Alexander and F. B. Pfeiffer, both of Akron, and J. W. White, Barberton, all in O., assignors to Seiberling Rubber Co., a corp. of Del.

1,895,296. **Vulcanizer.** F. J. Shook and C. Iverson, assignors to National Rubber Machinery Co., all of Akron, O.

Dominion of Canada

329,147. **Tire Airbag Inserter.** Goodyear Tire & Rubber Co., assignee of R. F. Snyder, both of Akron, O., U. S. A.

329,148. **Tire Shaper.** Goodyear Tire & Rubber Co., assignee of R. W. Snyder, both of Akron, O., U. S. A.

329,258. **Tire Building Chuck.** Goodyear Tire & Rubber Co., assignee of J. F. Campbell and J. D. Thomson, co-inventors, all of Akron, O., U. S. A.

United Kingdom

381,257. **Footwear Mold.** H. C. L. Dunker, Helsingborg, Sweden.

381,568. **Continuous Tire Mold.** Morgan & Wright, assignee of A. O. Abbott, both of Detroit, Mich., U. S. A.

381,649. **Rubber Cutter.** Dunlop Rubber Co., Ltd., London, and H. Willshaw, Ft. Dunlop.

381,658. **Tire Molding Core.** G. Vidale and Soc. Italiana Pirelli, both of Milan, Italy.

381,822. **Rubber Treating Machine.** Firestone Tyre & Rubber Co., Ltd., Middlesex, assignee of R. D. Wilhelm and E. E. Bevan, both of South Gate, Calif., U. S. A.

382,120. **Tire Cover Stripper.** A. Frogner, Gjövik, Norway.

382,235. **Latex Concentrating Apparatus.** Metallges. A.G., Frankfurt a. M., Germany.

382,341. **Portable Vulcanizer.** K. Honeyman and H. R. Dougherty, both of Queensland, Australia.

382,359. **Boot Anode Mold.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, and C. Hemm, Manchester.

Germany

568,384. **Tire Inflater.** L. M. Mercier, Neuilly-sur-Seine, France. Represented by W. Riese, Berlin-Charlottenburg.

PROCESS

United States

1,892,791. **Overshoe.** J. E. Taber, South Bend, assignor to Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, both in Ind.

1,893,363. **Activation of Carbonaceous Substances.** A. Godel, assignor to Société de Recherches & d'Exploitations Petrolifères, both of Paris, France.

1,893,561. **Polishing Finger Nails.** E. M. O'Donnell, Galva, Iowa.

1,893,939. **Metallic Coated Product.** M. Grossman, New York, N. Y.

1,894,237. **Breaker Strip.** G. D. Mallory, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,894,461. **Rubber Thread.** L. B. Chisholm, Providence, R. I.

1,894,610. **Overshoe.** W. Joy, Somerville, assignor to Cambridge Rubber Co., Cambridge, both in Mass.

1,894,629. **Goods from Aqueous Dispersions.** E. A. Murphy and R. G. James, both of Birmingham, and D. F. Twiss, Wylde Green, all in England, assignors to American Anode, Inc., Akron, O.

1,894,644. **Securing Rubber to Metal.** E. G. Sturdevant, Chicago, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,894,671. **Securing Rubber to Metal.** T. K. Cox, Chicago, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,895,088. **Colored Rubber Product.** B. S. Taylor, Stow, O., assignor to B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

329,242. **Branding Rubber Articles.** Dunlop Tire & Rubber Goods Co., Ltd., assignee of N. Pomfret, both of Toronto, Ont.

329,252. **Tire Breaker Strip.** Goodyear Tire & Rubber Co., assignee of G. D. Mallory, both of Akron, O., U. S. A.

329,255. **Rubber Processing.** Goodyear Tire & Rubber Co., Akron, O., assignee of J. P. McIntire, Los Angeles, Calif., both in the U. S. A.

329,256. **Tire Tread.** Goodyear Tire & Rubber Co., assignee of C. L. Brickman, both of Akron, O., U. S. A.

329,645. **Latex Treated Paper.** Gardner-Richardson Co., formerly Gardner & Harvey Co., Middletown, assignee of C. A. Thomas, Dayton, and J. H. Swan, III, Middletown, co-inventors, all in O., U. S. A.

329,646 and 329,647. **Latex Treated Paper.** Gardner-Richardson Co., formerly Gardner & Harvey Co., assignee of J. H. Swan, III, both of Middletown, O., U. S. A.

United Kingdom

381,366. **Repairing Cables.** C. J. Beaver and T. J. Fairfield, both of Cheshire, and W. T. Glover & Co., Ltd., Manchester.

381,986. **Latex Coated Fabric.** S. Platt, W. O. Street, and Bury Felt Mfg. Co., Ltd., all of Bury.

382,305. **Latex Dipped Gloves.** Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignee of A. Szegvari, Akron, O., U. S. A.

Germany

568,829. **Soft and Hard Rubber Linings.** Metallgesellschaft A.G., Frankfurt a. M.

569,145. **Diaphragms, Filters, Etc.** Franz Clouth Rheinische Gummiwarenfabrik A.G., Koln-Nippes.

CHEMICAL

United States

1,892,703. **Plastic Composition.** C. T. G. Lindh, Highland Park, assignor to American Rubber Products Co., Detroit, both in Mich.

1,892,719. **Accelerator.** G. Bruni and T. G. Levi, assignors to Societa Italiana Pirelli, all of Milan, Italy.

1,893,477. **Latex Vulcanization.** F. C. Van Heurn, Amsterdam, Netherlands, assignor, by mesne assignments, to Flintkote Corp., Boston, Mass.

1,893,630. **Accelerator.** W. E. Messer, assignor to Naugatuck Chemical Co., both of Naugatuck, Conn.

1,893,683 and 1,893,684. **Core Binder.** C. M. Saeger, Jr., Bowmanstown, Pa.

1,893,846. **Accelerator.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,893,868 and 1,893,869. **Accelerator.** H. A. Morton, Akron, O.

1,893,966. **Rubber Bleach.** F. L. Shew, Ashtabula, O.

1,894,230. **Age Resister.** A. M. Clifford, Stow, assignor to Goodyear Tire & Rubber Co., Akron, both in O.

1,894,231. **Antioxidant.** A. M. Clifford, Stow, assignor to Goodyear Tire & Rubber Co., Akron, both in O.

Dominion of Canada

328,902. **Chewing Gum Composition.** Sweets Laboratories, Inc., assignee of F. V. Canning, both of New York, N. Y., U. S. A.

329,084. **Cable Impregnating Composition.** National Electric Products Corp., New York, N. Y., assignee of R. J. McCrory, Baden, Pa., both in the U. S. A.

329,219. **Accelerator.** Canadian Indus-

tries, Ltd., Montreal, P. Q., assignee of H. M. Bunbury, W. J. S. Naunton, and J. S. H. Davies, co-inventors, all of Lancashire, England.

329,223. **Antioxidant.** Canadian Industries, Ltd., Montreal, P. Q., assignee of J. K. Hunt and G. H. Latham, co-inventors, both of Wilmington, Del., U. S. A.

329,225. **Age Resister.** Canadian Industries, Ltd., Montreal, P. Q., assignee of A. J. Hailwood, Altrincham, and F. J. Siddle, Manchester, co-inventors, both in England.

329,254. **Age Resister.** Goodyear Tire & Rubber Co., Akron, assignee of G. R. Yohe, Delaware, both in O., U. S. A.

329,261. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of L. B. Sebrell, both of Akron, O., U. S. A.

329,495. **Factice Manufacture.** Societa Italiana Pirelli, assignee of M. Faldini, both of Milan, Italy.

329,524. **Vulcanized Product.** J. C. Patrick and N. M. Mnookin, co-inventors, both of Kansas City, Mo., U. S. A.

329,542. **Coating Compound.** A. M. Dunstone, Sydney, N. S. W., Australia.

329,563. **Rubber Composition.** J. C. Patrick, Kansas City, Mo., U. S. A.

329,640. **Aqueous Dispersion of Rubber.** Flintkote Corp., Boston, Mass., assignee of H. L. Levin, Rutherford, N. J., both in the U. S. A.

329,653. **Rubber Composition.** B. F. Goodrich Co., New York, N. Y., assignee of A. W. Sloan, Akron, O., both in the U. S. A.

United Kingdom

381,098. **Chlorinated Rubber Composition.** I. G. Farbenindustrie A.G., Frankfurt a. M., Germany.

381,186. **Porous Rubber Composition.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, and E. A. Murphy and D. F. Twiss, both of Ft. Dunlop.

381,189. **Accelerator.** Imperial Chemical Industries, Ltd., London, H. M. Bunbury, J. S. H. Davies, and W. J. S. Naunton, all of Manchester.

381,225. **Impregnating Composition.** Imperial Chemical Industries, Ltd., London, and W. E. Sanderson and F. I. Siddle, both of Manchester.

381,518. **Carbon Containing Composition.** Dr. A. Wacker Ges. Für Elektrochemische Industrie Ges., Munich, Germany.

381,587. **Rubber Composition.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.

381,774. **Gutta Percha Composition.** H. Trebitsch, Vienna, Austria.

381,927. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, and B. W. D. Lacey and P. J. Bawcutt, both of Ft. Dunlop.

382,147. **Bitumen-Rubber Composition.** A. Thielmann, Hilden, Germany.

382,419. **Coating Composition.** H. Hands, Stockport.

382,557. **Bituminous Composition.** S. Krishna, Dehra Dun, India.

382,561. **Rubber Thread Treatment.** J. Römpler A.G., Zeulenroda, assignee of Saluthea-Ges., Untertürkheim, both in Germany.

382,667. **Insulating Composition.** Electrical Research Products, Inc., New York, N. Y., assignee of A. R. Kemp, Westwood, N. J., and A. N. Gray, Baltimore, Md., all in the U. S. A.

382,755. **Polymerized Rubber Hydrocarbon.** J. Y. Johnson, London. (I. G. Farbenindustrie A.G., Frankfurt a. M., Germany.)

382,756. **Latex Composition.** A. E. Bond, Surrey.

382,940. **Accelerator.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

Germany

567,217. **Aqueous Dispersions from Crude or Reclaimed.** Societa Italiana Pirelli, Milan, Italy. Represented by H. Herzfeld, Berlin.

567,392. **Electro-Deposition Objects.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Guernsey, Channel Isles. Represented by W. Karsten and C. Wiegand, both of Berlin.

567,942. **Simultaneous Dissolution of Rubber and Nitro-Cellulose.** Deutsche Hydrierwerke A.G., Rodleben b. Rosslau i. Anhalt.

568,266. **Vulcanizing Rubber.** Rubber Service Laboratories Co., Akron, O., U. S. A. Represented by G. Lotterhos, Frankfurt a. M., and H. Mortensen and W. von Sauer, both of Berlin.

568,906. **Objects from Polymerization Products of the Butadiene Hydrocarbons.** I. G. Farbenindustrie A.G., Frankfurt a. M.

569,523. **Latex Concentrates.** Revertex, Ltd., London, England. Represented by F. Cochlovius, E. Zopf, and W. Naumann, all of Frankfurt a. M.

569,524. **Objects by Coagulating Latex.** Metallgesellschaft A.G., Frankfurt a. M.

569,526. **Antiager.** H. A. Morton, Akron, O., U. S. A. Represented by B. Kugelmann, Berlin.

GENERAL

United States

1,892,727. **Football Valve.** W. Haubensak and W. A. Wetterwald, both of Zurich, Switzerland.

1,892,804 and 1,892,805. **Truss Pad.** I. M. Pease, Cincinnati, O., assignor to Ohio Truss Co., a corp. of O.

1,892,943. **Vibration Absorbing Connector.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.

1,892,944. **Multiple Leaf Spring.** H. D. Geyer and A. H. Flower, assignors to Inland Mfg. Co., all of Dayton, O.

1,892,979. **Wheel and Tire Handler.** T. N. Clark, Rock Island, Ill.

1,893,000. **Submersible Toy.** L. Ranney, New York, N. Y.

1,893,162. **Tank Floating Roof Seal.** J. M. Cranz, Buffalo, N. Y.

1,893,245. **Truck Mirror.** O. C. Ritz Woller, Chicago, Ill.

1,893,266. **Electric Cable.** M. Barberis and U. Baggi, both of Turin, assignors, by mesne assignments, to S. I. R. T. I. (Società Italiana Reti Telefoniche Interurbane), Milan, Italy.

1,893,507. **Hydraulic Toy.** L. Ranney, New York, N. Y.

1,893,579. **Fountain Pen.** R. S. Carter, Hewlett, N. Y.

1,893,580. **Wheel Chock.** R. S. Colley, Kent, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,893,645. **Valve Stem and Tube Holder Support.** E. M. Godfrey, Jr., Knoxville, Tenn.

1,893,795. **Shoe Last.** R. McK. Chapman, Erwin, Tenn.

1,893,853. **Artificial Limb.** A. E. Tullis, Minneapolis, Minn.

1,893,948. **Door Key Attachment.** W. Klotz, Dusseldorf, Germany.

1,893,960. **Abdominal Supporting Belt.** I. M. Pease, Cincinnati, O.

1,893,975. **Spring.** W. C. Jackson, assignor to Tingley Reliance Rubber Corp., both of Rahway, N. J.

1,894,066. **Glove.** E. J. Smith, Ravenna, O.

1,894,161. **Hot Water Bottle Attachment.** J. B. Crapo, Wakefield, N. H.

1,894,175. **Flexible Coupling Disk.** J. R. Hemeon, assignor to Thermoid Rubber Co., both of Trenton, N. J.

1,894,269. **Hose.** H. W. Goodall, Aldan, Pa.

1,894,444. **Headrest.** W. J. Heintz, Utica, N. Y.

1,894,490. **Tire Pressure Gage.** A. W. Hobson, San Francisco, Calif.

1,894,559. **Body Fitting Writing Board.** L. H. Fisher, Huntingburg, Ind.

1,894,648. **Pressure Gage.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,894,706 and 1,894,707. **Golf Club.** W. F. Reach, Springfield, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.

1,894,711. **Faucet Connector.** C. A. Schacht, Huntington, Ind.

1,894,852. **Deep Sea Cable Coil Piece.** O. Cords, assignor to Felten & Guilleaume Carlswerk A.G., both of Cologne-Mulheim, Germany.

1,894,862. **Windshield Clear Vision Attachment.** E. W. Grudnicki, Ashley, Pa.

1,894,888. **Shoulder Strap.** R. Ponton, Central Falls, R. I.

1,895,039. **Suction Press Roll.** J. F. Joseph, Cincinnati, assignor to Cincinnati Rubber Mfg. Co., Norwood, both in O.

1,895,340. **Tire Boot.** J. F. Panyard, assignor to M. B. Panyard, both of Detroit, Mich.

1,895,392. **Hat Ventilating Strip.** M. Popper, New York, N. Y.

1,895,418. **Permanent Wave Clasp.** M. Lindsay, Dallas, Tex.

Dominion of Canada

328,810. **Friction Element.** American Brake Materials Corp., New York, N. Y., assignee of W. A. Blume, Detroit, Mich., both in the U. S. A.

328,886. **Inflating Coupling.** A. Schrader's Son, Inc., assignee of J. Wahl, both of New York, N. Y., U. S. A.

328,961. **Swing Ball.** M. Breidenbach, Mainz, Germany.

329,038. **Muffler and Strainer.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of G. K. Newell, Level Green, Pa., U. S. A.

329,133. **Windshield Wiper.** Willis Wiper Co., Ltd., Belfast, assignee of H. Willis, Bangor, both in Ireland.

329,253. **Pneumatic Tire.** Goodyear Tire & Rubber Co., Akron, assignee of A. J. Musselman, Cuyahoga Falls, both in O., U. S. A.

329,257. **Cord Fabric.** Goodyear Tire & Rubber Co., assignee of S. A. Steere, both of Akron, O., U. S. A.

329,257. **Cord Fabric.** Goodyear Tire & Rubber Co., Akron, O., assignee of L. S. Hall, New Bedford, Mass., both in the U. S. A.

329,338. **Rubbing and Sanding Pad.** F. E. Newcomb, E. Cleveland, inventor, and F. E. Hendrickson, Cleve-

land, assignee of ½ interest, both in O., U. S. A.

329,366. **Tire Valve Mechanism.** R. E. Buck, Kalamazoo, Mich., U. S. A.

329,388, 329,389, and 329,390. **Tire Valve Mechanism.** J. D. Lear, Buffalo, N. Y., U. S. A.

329,416. **Level.** G. Watland, Forsund, Norway.

329,469. **Pneumatic Spring Suspension.** Forsyth Automotive Pneumatic Spring, Ltd., assignee of A. E. Forsyth, both of Ottawa, Ont.

329,561. **Finger Stall.** C. B. McDougall, Wellington, New Zealand.

329,619. **Fountain Pen.** Chilton Pen Co., Inc., Long Island City, assignee of H. Krause, New York, both in N. Y., U. S. A.

329,695. **Jar Closure.** Vacseal Containers, Ltd., assignee of J. F. Crowley, both of London, England.

329,703. **Puncture Sealing Device.** M. J. Galvin, inventor, and A. P. Reid and D. D. Bennett, assignees of 49% of the interest, all of Toronto, Ont.

United Kingdom

380,368. **Elastic Yarn.** P. Adamson, Rye, N. Y., U. S. A.

380,648. **Swimming Appliance.** R. B. Pughe-Morgan, Wiltshire.

381,080. **Elastic Yarn.** L. W. Joyce, Greensborough, N. C., U. S. A.

381,251. **Tire Pressure Gage.** W. Turner & Bro., Ltd., and W. Turner, both of Sheffield.

381,307. **Pipe Interior Coating Apparatus.** Soc. Satujo Soc. Anon. De Construction De Tuyaux Sans Joints, Paris, France.

381,407. **Radio-Active Compress.** F. Treanor, Surrey, and Radiopathic Institute, Ltd., London.

381,445. **Foot Arch Support.** M. Mayr, Berlin, Germany.

381,470. **Brush.** E. Heckert, Berlin, Germany.

381,496. **Elastic Stocking.** J. Römpler A.G., Zeulenroda, Germany.

381,595. **Filter.** Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignee of Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.

381,636. **Photographic Printing Machine.** Pako Corp., assignee of J. W. Houch and G. M. Dye, all of Minneapolis, Minn., U. S. A.

381,691. **Wheel.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

381,823. **Printing Machine.** W. J. Davis and Tress & Co., Ltd., both of London.

381,843. **Gum Massager.** F. Brown, Philadelphia, Pa., U. S. A.

381,890. **Hot Water Bottle.** W. Stoll, Berlin, Germany.

381,914. **Galvanic Battery.** Britannia Batteries, Ltd., London.

381,975. **Upholstering Material.** L. E. Howard, London.

382,092. **Tennis Racket Press and Casing.** R. W. Leisner, Oslo, Norway.

382,117. **Horseshoe.** J. Cleary, Templeshannon, Enniscorthy, Co. Wexford, Irish Free State.

382,134. **Umbrella Rib Holding Clip.** I. H. Davies, Middlesex.

382,150. **Tire Deflation Signal.** F. Müller, Liegnitz, Germany.

382,299. **Tire.** H. Thorburn, Toronto, Canada.

382,490. **Toilet Article Tray.** Asprey & Co., Ltd., and C. E. Gee, both of London.

382,500. **Well Filter Tube.** F. Wurz, Baden, Germany.

382,537. **Can Lid.** I. G. Farbenindustrie A.G., Franfurt a. M., Germany.

382,822. **Dental Rubber Cutter.** R. Bosch A.G., Stuttgart, Germany.

383,124. **Pneumatic Railway Tire.** Michelin & Cie., Clermont-Ferrand, Puy-de-Dome, France.

Germany

568,467. **Belt.** K. Scheitinger, Berlin-Steglitz.

TRADE MARKS

United States

299,919. **Grey-Rock, Flex-Balanced.** Belts. Raybestos-Manhattan, Inc., Passaic, N. J.

299,977. **Firestone.** Separators, other battery parts, etc. Firestone Battery Co., Akron, O.

300,067. **Pro-Tex.** Prepared latex as a temporary covering. Copeman Protex Co., Flint, Mass.

300,109. **Ample-Aire Cushion Capped.** Tires. Pharis Tire & Rubber Co., Newark, O.

300,144. **Ensign.** Golf balls. Seiberling Latex Products Co., Barberton, O.

300,275. **Corvell—70—.** Tires, tubes, and portable tire patch outfits. L. L. Coryell & Son, Lincoln, Neb.

300,300. Triangle containing representation of a bust of knight, and the word: **"Helmets."** Prophylactic articles. Knights Co., Cambridge, Mass.

300,315. **Ideal.** Nipples. Pyramid Rubber Co., Ravenna, O.

300,322. **Supple-spun.** Fabrics of knitted elastic cotton yarns. Kops Bros., Inc., New York, N. Y.

300,419. **Beartex.** Carbon black. Wilckes, Martin, Wilckes Co., New York, N. Y.

300,420. **Spring-Step.** Rubber cement. United States Rubber Co., New York, N. Y.

300,429. Square containing representation of a robot holding sign bearing the words: **"Robot Packings."** Mechanical goods, packings, tires, etc. Armor Products, Inc., New York, N. Y.

300,498. Representation of a winged foot in the middle of the word: **"Goodyear."** Brake lining. Goodyear Tire & Rubber Co., Akron, O.

300,511. **Advance.** Heels and soles. Bradstone Rubber Co., Woodbine, N. J.

French Rubber Sponges

THE method of making rubber sponges as generally practiced in France is outlined in the following procedure.[1]

TYPICAL SPONGE FORMULA

	Parts by Weight
Pale crepe rubber	45.0
Stearic acid	0.5
Paraffin	2.5
Vaseline	5.0
Whiting	25.0
Lithopone	10.0
Zinc oxide	2.0
Magnesium carbonate	5.0
Organic color	1.5
Sulphur	3.25
D. P. G. accelerator	0.25

In this mixing the rubber is first milled 50 minutes on tightly closed rolls, then for the same length of time with the rolls set 1-inch apart. The temperature of the rubber during miling is kept at 104° F. After the rubber has been milled the stearic acid and paraffin are added in liquified condition, and milling is continued for 1 hour, following which the remainder of the ingredients are ground into the batch for 30 minutes. Plasticizing and mixing the batch thus require 3 hours and 10 minutes.

After mixing, the batch is stored for several days before the inflating materials are added. These consist of 5 liters of a saturated solution of ammonium bicarbonate and 1 liter (1.0567 quarts) of alcohol to each 100 kilograms (2.2046 pounds) of the rubber mixing. The work is done on cold rolls and is completed in 15 minutes to each batch. The stock is sheeted on the mill, cut, and assembled for cold pressing in a mold of desired dimensions. The block thus formed is ready for vulcanization ina double jacketed heater or oven in which several shelves of perforated sheet iron are arranged to hold the loaves of rubber to be cured. A sheet of paper treated with vaseline is placed on the sheet iron under the rubber, which is held in place by movable flat iron pieces 8 to 10 cm. (3¼ to 4 inches) high.

The external jacket of the heater is fitted with a steam inlet, safety valve, and steam outlet. The inner part is piped for compressed air, steam, and water, with water and steam outlets. Pressure gages are arranged on the inner and outer chambers and thermometers on the interior chamber which, also, has a gage-glass by which the depth of water can be observed.

Vulcanization is conducted as follows. Water is admitted to the inner chamber up to about ¾ full as checked by the gage-glass. Compressed air is allowed to enter to obtain a pressure of 6.6 pounds. At the same time steam is admitted into the exterior jacket to reach 248° F. in 20 minutes, and 260° F. in 30 minutes. After holding at 260° F. for 10 minutes, the water is let out and steam is admitted to the inside to maintain the temperature at 260° F., while the air pressure is reduced to 3.3 pounds. Vulcanization is continued under these conditions for 70 minutes. (Total cure 110 minutes.) Then steam and air pressures are dropped by opening the outlets.

The rather irregular blocks of cured sponges have a slight crust over the entire surface and must be immediately squeezed several times between the rolls of a small calender to break the air cells.

The sponges are then cut to required dimensions in a special machine, the knife of which works in water, and can cut either horizontally or vertically. The regular forms thus obtained are placed into a hot air dryer. After drying they are trimmed to shape with scissors ready for inspection and packaging.

[1] *Rev. gén. caoutchouc*, Sept. 1932, pp. 29-30.

Editor's Book Table

RUBBER BIBLIOGRAPHY

VULCANIZATION ACCELERATORS. F. Jacobs, *Caoutchouc & gutta-percha*, Dec. 15, 1932, pp. 16222-25; Jan. 15, 1933, pp. 16258-60.

ELECTRICALLY HEATED REPAIR VULCANIZERS FOR TIRES AND INNER TUBES. Dr. Salmony, *Caoutchouc & gutta-percha*, Dec. 15, 1932, pp. 16231-32.

VARNISHES AND LACQUERS FOR RUBBER FOOTWEAR. D. D. Wright, *Ind. Eng. Chem.*, Feb., 1933, pp. 140-41.

EFFECT OF OXYGEN AND WATER ON POLYMERIZATION OF CHLOROPRENE. I. Williams and H. W. Walker, *Ind. Eng. Chem.*, Feb., 1933, pp. 199-202.

ORGANIC ACCELERATORS. G. Oenslager, *Ind. Eng. Chem.*, Feb., 1933, pp. 232-37.

CARBON BLACK AS A RUBBER FILLER. I, II. Adsorption Properties of Carbon Black. T. Semba and S. Itoh, *J. Soc. Chem. Ind. (Japan)*, 35, pp. 470-72B (1932).

TESTING RUBBER ANTIOXIDANTS. H. J. Stern and W. Puffett, *Trans. Inst. Rubber Ind.*, 8, pp. 216-26 (1932).

ANTIOXIDANTS IN RUBBER PROOFING. W. N. Lister, *Trans. Inst. Rubber Ind.*, 8, pp. 241-50 (1932).

CHLORINATED RUBBER RESINS. H. A. Gardner and J. R. Stewart, *Amer. Paint & Varnish Manufrs. Assoc.*, May, 1932, Circ. No. 410, pp. 164-67.

NATURE OF THE ACTION OF ORGANIC ACCELERATORS FOR VULCANIZATION. I. Action on Rubber Sols. K. Shimada, *J. Soc. Chem. Ind. (Japan)*, 35, pp. 473-78B (1932).

TENTH ANNUAL REPORT OF THE RUBBER RESEARCH SCHEME (Ceylon), June, 1932, 28 pages, 9½ by 6¼ inches. Columbo: Government Printing Office, 1932.

USE OF RUBBER IN THE PRINTING INDUSTRY. H. P. Stevens (and discussion), *Bull. Rubber Growers' Assoc.*, Jan., 1933, pp. 16-34.

STUDIES ON THE THERMOCHEMISTRY OF THE VULCANIZATION OF RUBBER. VII. Heating Curves for the Vulcanization of the System: Raw Rubber-Sulphur (2). K. Hada and T. Nakajima, *Rubber Chem. & Tech.*, Jan., 1933, pp. 56-63.

MODIFICATIONS OF THE GUTTA PERCHA HYDROCARBON. II. A. W. K. de Jong, *Rubber Chem. & Tech.*, Jan., 1933, pp. 86-91.

STUDIES IN THE PRODUCTION OF SPONGE RUBBER. G. L. Barron, *India Rubber J.*, Jan. 14, 1933, pp. 47-50.

ELASTIC PROPERTIES OF VARIOUS MATERIALS AND THEIR EFFECT ON THE TRANSMISSION OF VIBRATIONS. B. E. Eisenhour and F. G. Tyzzer, *India Rubber J.*, Jan. 21, 1933, pp. 77-78, 80-83.

SULPHURIC ACID AS A LATEX COAGULANT. Anon., *India Rubber J.*, Jan. 28, 1933, pp. 104-106, 108.

DETERMINATION OF SIZE, FORM, AND SOLVATION OF MACROMOLECULES. G. V. Schulz, *Rubber Chem. & Tech.*, Jan., 1933, pp. 101-102.

ACETYLENE POLYMERS AND THEIR DERIVATIVES. III. Addition of Hydrogen Chloride to Vinylacetylene. W. H. Carothers, G. J. Berchet, and A. M. Collins, *Rubber Chem. & Tech.*, Jan., 1933, pp. 121-25.

IMPORTANCE OF ACCELERATORS IN THE MODERN RUBBER INDUSTRY. H. L. Trumbull, *Ind. Eng. Chem.*, Jan., 1933, pp. 230-32.

PHYSICS OF MEMBRANES. E. Manegold, *Kolloid-Z.*, Nov., 1932, pp. 140-60.

ELASTICITY OF RUBBER. K. H. Meyer, G. v. Susich, and E. Valko, *Kolloid-Z.*, Dec., 1932, pp. 370-71. (Observations on H. Staudinger's Communication 40, on the Elasticity of Rubber.)

IMPORTANCE OF THE PART PLAYED BY THE PNEUMATIC TIRE IN AVIATION. L. P. Max, *Rev. gén. caoutchouc*, Dec., 1932, pp. 3-7.

RUBBERIZING WITH LATEX. L. Grand, *Rev. gén. caoutchouc*, Dec., 1932, p. 8.

PLASTIFICATION OF RUBBER. F. Jacobs, *Rev. gén. caoutchouc*, Dec., 1932, pp. 9-18.

ELECTRO-DEPOSITION OF RUBBER FROM REVERTEX AND REVULTEX. N. Budiloff, *Kautschuk*, Jan., 1933, pp. 1-4.

TESTING THE TINNING OF RUBBER INSULATED COPPER WIRES. A. R. Mathis, *Kautschuk*, Jan., 1933, pp. 4-8.

EXPERIENCES WITH HIGH PRESSURE HOT WATER HEATING IN RUBBER FACTORIES. H. Brandt, *Kautschuk*, Jan., 1933, pp. 8-11.

ACTION OF ACCELERATORS. H. J. Grundel, *Gummi-Ztg.*, Jan. 6, 1933, pp. 359-60.

EQUALIZING THE FLUCTUATIONS OF STEAM CONSUMPTION IN RUBBER GOODS FACTORIES. F. Praetorius, *Gummi-Ztg.*, Jan. 13, 1933, pp. 385-86; Jan. 20, pp. 413-15.

"Modernization Pays." General Electric Co., Schenectady, N. Y. For over 2 years this company has stressed the idea that the right kind of modernization pays and has carried out the modernization scheme in its own plants. It was from the experience thus gained that the convincing examples recorded in this booklet were drawn.

The Vanderbilt News. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The January-February, 1933, issue is devoted entirely to a treatise on Plastogen and its effects on the physical characteristics of crude rubber; its advantages in compositions for tire carcasses, inner tubes, footwear, molded goods, and various other articles; also practical hints concerning its application in rubber mixing.

BOOK REVIEWS

"Rubber Latex." Henry P. and W. H. Stevens. Issued by The Rubber Growers' Association, Inc., 2, 3, and 4 Idol Lane, Eastcheap, London, E. C. 3, England. Paper, 155 pages, 5½ by 8½ inches. Illustrated.

This is a revised and enlarged edition of the work by the same authors, first issued July, 1928. The book deals with the properties, composition, coagulation, concentration, manipulation, and compounding of latex and latex pastes and its stabilization for industrial purposes. The vulcanization of latex and latex products, dipping, electro-deposition, and the marketing and applications of latex are also discussed. A final chapter deals with a selected list of over 500 recent British patents and testifies to the growing importance which is attached to the direct application of latex. An index to the text and to the patents, together with a very full bibliography of books of reference and literature are included and should prove very useful to latex users.

"Latex and Its Industrial Applications." By Frederick Marchionna. The Rubber Age Publishing Co., New York, N. Y., 1933. Cloth, 1,037 pages. 6 by 9 inches. Comprehensively indexed. Price $15.00.

In this valuable compendium are brought together bibliographical references on the industrial development of latex. The work represents much painstaking effort on the part of the compiler in collecting and preparing abstracts of United States and foreign patent specifications, scientific and technical papers.

The book has a foreword by Prof. G. Bruni, research chemist, Milan, Italy, who finds the compilation meritorious and recommends it to all workers in this new and fascinating field.

The material is conveniently classified in 11 chapters, each with an appropriate introduction of the topic, followed by abstracts of the related patent and technical literature. All abstracts are numbered consecutively throughout the book for easy reference. The chapter headings are: (1) Rubber Plants, (2) Planting and Cultivation of Rubber, (3) Collecting and Extracting Latex, (4) Preservation of Latex and Rubber, (5) Behavior and Characteristics of Latex, (6) Coagulation of Latex, (7) Preparation of Rubber, (8) Direct Use of Latex in Industry, (9) Artificial Latex, (10) Electrodeposition of Rubber, (11) Structure of Rubber. The volume is provided with 4 indices: (1) Author, (2) Patentees, (3) Patents, and (4) Subject.

The book is rendered valuable by the ready accessibility it affords for reference to the practical results of research and invention as related to progress in the development of the industrial uses of rubber latex.

Market Reviews

CRUDE RUBBER

THE statistical position has shown no unexpected changes in the last month, and except for the addition of a few more tons to United States stocks the outlook is the same as it was a month ago.

One event that did cause a stir was the cut in tire prices by manufacturers, ostensibly to meet reduced prices in the spring mail-order catalogs. Nothing could have been more foolish and more harmful to the industry, in the opinion not only of traders, but of those manufacturers forced to meet the cut. Sales are abnormally low; the margin of profit is small; and the cuts are ruinous. With shipments of casings 34.6% below the low rate of last year and stocks on hand only 1.7% less, the figures show that people are not buying tires even though prices without the cut are the lowest in history.

Automobile production, moreover, has fallen sharply since December when manufacturers rushed their new models to dealers, and there is no indication that sales will exceed last year's, for a few months at least. One service predicted that it would not be until the last half of 1933 that automobile sales would surpass those of 1932. General Motors made a good showing in January, but taking the industry as a whole, sales are not much above expectations.

Malay rubber shipments give no signs of slacking. Imports to the United States increased 8% in January, and with consumption at 21,661 tons, our stocks were added to by a few more tons and are now within easy reach of 400,000 tons. It is helpful to see that British stocks are declining, but not nearly fast enough to overcome our 400,000-ton heap of rubber.

The Outside Market has been extraordinarily dull in February. Outside of a few sales to large manufacturers on one or 2 occasions, buyers were scarce. Prices have lost ground only fractionally, but the tendency at the end of the month was downward.

The tire industry is very dull; and since it accounts for a large part of the rubber business, actuals have reflected the dullness.

Week ended January 28. At one time prices were 16 to 20 points higher than last week, but subsequent commission house liquidation erased the gain, and prices at the end of the week were unchanged to 2 points higher. A drop of 1,750 tons in British stocks estimated for the present week supported quotations, but primary centers were dull, and with the Singapore market closed because of the Chinese holiday, prices were vulnerable.

March closed at 2.99¢, compared with 2.97¢ the week previous; May 3.04 against 3.03; July 3.11 against 3.09; October 3.21 unchanged; and December 3.31 unchanged.

Dutch East Indies shipments for December were 20,670 tons, compared with 20,014 tons in November and 23,940 in December, 1931. For the year shipments from this source were 230,107 tons against 284,199 tons in 1931, a drop of 19%. The year's shipments from Malaya were about 8% lower.

Large and small estate production figures were also given by The Rubber Exchange of New York, Inc., and for 1932 reached a total of 416,784 tons, compared with 436,456 tons in 1931, a drop of about 4½% accounted for by the estates less than 100 acres in size, operated principally by natives, while the larger European-owned estates showed a slight increase.

At the year-end large and small estates reported a total of 40,974 tons in December against 34,031 in November and 39,837 in December, 1931; so the trend seems to be upward again.

In the Outside Market business was mixed. Manufacturers bought a small quantity of rubber on the decline, but offerings were limited. Prices were off about $\frac{1}{16}$¢.

March ribbed smoked sheets were 3¢ against 3 1/16¢; April-June 3⅛ against 3 3/16; July-September 3¼ against 3 5/16; and October-December 3⅜ against 3 7/16.

Week ended February 4. With January Malay shipments 6,481 tons higher than in December, the rubber market received a jolt that sent the low prices lower. This fact together with the ill-advised cut in tire prices made for a weak undertone in sentiment which some traders say might result in another decline to record lows.

Trading was quiet during the week, else the changes of 2 points up to 3 points down might have shown a wider spread. The March contracts closed at 2.96¢, compared with 2.99¢ the week before; May 3.03 against 3.04; July 3.10 against 3.11; September 3.17 unchanged; and December 3.29 against 3.31.

The Malay total for January was 46,599 tons against 40,118 shipped in December and 42,638 in January, 1932. An increase had been expected in the trade, but the jump of 6,481 tons was above all estimates. Ceylon shipments were 4,641 tons in January against 5,169 in December and 4,568 in January, 1932.

December automobile figures put production at 109,542 units in the United States and Canada, compared with 61,761 in November and 123,973 in December, 1931. The 1932 figure was 1,431,544 units against 2,472,359 in 1931.

A spurt in Chevrolet production for the

RUBBER BEAR POINTS

1. February rubber consumption is put at a figure lower than that of January, 1933, and of February, 1932.
2. Automobile production declined sharply in February.
3. Untimely tire-price cuts due to competition were regretted even by the manufacturers making them.
4. Imports of crude rubber increased 8% in January as compared with December and were only 1% lower than in January, 1932.
5. Domestic stocks on January 31 totaled 396,376 long tons, against 388,229 on December 31 and were an increase of 22.8% over those a year ago.
6. January Malay shipments were 46,599 tons, compared with 40,118 in December and 42,638 in January, 1932.
7. Pneumatic casings shipped in December were 34.6% below those of the year before; production was 13.9% under November and 25% below December, 1931; pneumatic casings on hand were 2.5% higher than November 30 and 1.7% under December last year.

RUBBER BULL POINTS

1. Crude rubber afloat for the United States on January 31 amounted to 32,539 tons against 38,360 on December 31 and 42,234 on January 31, 1932.
2. Ceylon shipments were 4,641 tons in January against 5,169 in December and 4,568 in last January.
3. United Kingdom stocks have declined almost 30% since last year.
4. Dutch East Indies shipments in December were 20,670 tons against 20,014 tons in November and 23,940 tons in December, 1931. Shipments in 1932 were 19% under those of 1931.
5. Automobile producers are optimistic about 1933 sales.

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	January, 1933							February, 1933													
	23	24	25	26	27	28	30	31	1	2	3	4	6	7	8	9	10	11	13*	14	15	16	17	18
Ribbed Smoked Sheet....	3	3 1/16	3 1/16	3 1/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	3	2 15/16	2 15/16	3	3	3	...	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16
No. 1 Thick Latex Crepe	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 1 Thick Latex Crepe	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	...	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16
No. 1 Brown Crepe.....	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16	...	2 15/16	2 15/16	2 15/16	2 15/16	2 15/16
No. 2 Brown Crepe.....	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16	...	2 7/16	2 7/16	2 7/16	2 7/16	2 7/16
No. 2 Amber.....	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	...	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16
No. 3 Amber.....	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	...	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16
No. 4 Amber.....	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	...	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16
Rolled Brown	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16	...	2 1/16	2 1/16	2 1/16	2 1/16	2 1/16

* Holiday.

January 28 week was largely responsible for the rise in *The New York Times'* index to 48.1 against 42.0 for the preceding week and 39.0 for the corresponding week last year. The strike in Briggs Mfg. Co. has virtually stopped all production of Ford cars.

A new price war in automobile tires was received with general regret throughout the industry. It started when the Firestone Tire & Rubber Co. announced that because the spring catalogs of the mail-order houses contained prices 5% lower than those of Firestone, that company was making cuts of from 5 to 10% to meet those of its competitors. No sooner was this announcement made than Sears Roebuck & Co., and the Seiberling Rubber Co. countered with reductions of 5 to 15%, again cutting below their catalog prices.

Traders in the street regarded the cuts as the "Most foolish move that could be made at this time," as one man expressed it. It was probably inevitable, however, since manufacturers have been giving rebates and large discounts while maintaining list prices, dating back to last September.

An exceptionally quiet week in a market which has not been very active for some time characterized trading in the Outside Market. Sales were negligible, with dealers trying to maintain prices. Quotations were listed in thirty-seconds during the week, and changes were fractional from the week before.

March ribbed smoked sheets were quoted at 3¢ unchanged: April-June 3 3/32 against 3 1/8; July-September 3 3/32 against 3 1/4; and October-December 3 1/32 against 3 3/16.

Week ended February 11. With fluctuations confined to sixteenths and thirty-seconds of a point, the rubber market went through another dull session. The Singapore market was closed Wednesday because of a local holiday, and the usual evening up process was evident here at the week-end because of the Lincoln's Birthday holiday on Monday.

Prices were unchanged to 2 points down. March closed at 2.96¢ unchanged: May was unchanged at 3.03; July 3.08 against 3.10; October 3.20 against 3.21; December 3.27 against 3.29; and January 3.32 against 3.34.

After 2 years of negotiations the hide, rubber, metal, and silk exchanges will be united as the Commodity Exchange, Inc., on May 1. The idea of consolidation is to save overhead expenses. Membership will be limited to 1,015 members; and with each member paying in $900, the new exchange will have a working capital of over $900,000. Until a satisfactory lease is negotiated, the exchanges will operate in their present quarters.

Pneumatic casings figures for December reveal an increase of 6.3% in shipments over November, but a drop of 34.6% under December, 1931. Stocks on December 31 were 2.5% higher than on November 30 and 1.7% lower than on December 31, 1931. Production declined 13.9% from November and 25% from December, 1931, according to The Rubber Manufacturers Association, Inc.

Business in the Outside Market was not much changed from that on the Exchange. One large manufacturer was reported in the market, but on the whole the week was dull and featureless.

Prices fluctuated only a fraction. March sold at 3¢ unchanged; April-June 3 1/8 against 3 3/32; July-September 3 1/4 against 3 5/32; and October-December 3 3/8 against 3 11/32.

Week ended February 18. Switching operations in the March contract comprised most of the business done on the Exchange during the week, and prices moved within narrow ranges. The January consumption report was about the same as estimated by traders and caused no change marketwise. Supporting sentiment in the Exchange and other commodity markets was weak principally because of the banking holiday in Michigan.

Prices were from 3 to 8 points lower than last week. March closed at 2.89¢, compared with 2.96¢ last Saturday; May 2.95 against 3.03; July 3.05 against 3.08; September 3.14 against 3.17; December 3.23 against 3.27; and January 3.28 against 3.32.

The amount of rubber consumed by manufacturers in the United States for January was reported to be 21,661 long tons by The Rubber Manufacturers Association, Inc. In December, 1932, it was 16,990 tons and in January, 1932, 27,962 tons.

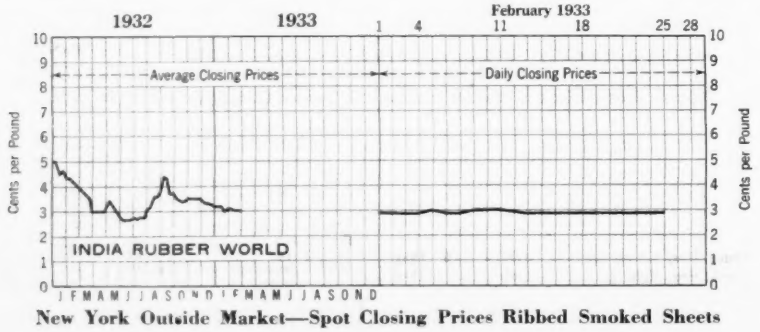
Imports totaled 31,110 long tons, 8.9% higher than in December, and 1% less than in January, 1932.

Domestic stocks, therefore, increased again to 396,376 tons on January 31 against 388,229 on December 31. January stocks were 2.1% higher than in December, 1932, and 22.8% higher than stocks on January 31, 1932. Rubber afloat for the United States on January 31 amounted to 32,539 long tons, compared with 38,360 tons on December 31, 1932, and 42,234 on January 31, 1932.

The continued accumulation of rubber stocks in this country is the tremendous weight largely responsible for the inability of prices to shake themselves loose from the low levels prevailing for so long. Producing centers give signs of a reduction in output, but in such small amounts as to be negligible. Consumption has fallen at a rate to practically offset the decline in production. British stocks are the only bright spot, and are almost 30% less than last year. But with only 90,358 tons on hand against almost 400,000 in this country, the drop is not so beneficial as it might be.

The situation in the automobile field is mixed. Production at present is declining, contrary to the usual seasonal trend which calls for an increase about this time. Most of the manufacturers this season swung into full production early in December in-

(*Continued on page 66*)



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

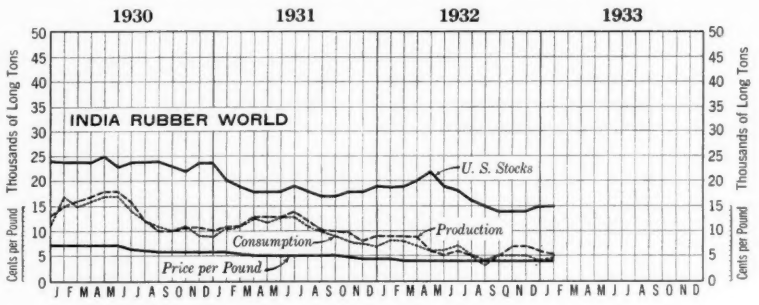
New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	Feb. 24, 1932	Jan. 25, 1933	Feb. 25 1933
Rubber latex...*gal.*	51	42	42
Sheet			
Ribbed, smoked, spot	4 /4 1/16	3	2 11/16
Feb.-Mar.	4 /4 1/16		2 11/16
Apr.-June	4 1/16/4 1/16	3 1/16	3 /3 1/16
July-Sept.	4 3/8	3 1/4	3 1/8/3 1/4
Crepe			
No. 1 thin latex, spot	4 3/4/4 7/8	3 3/4/3 13/16	3 3/4/3 13/16
Feb.-Mar.	4 3/4/4 7/8		3 3/4/3 13/16
Apr.-June	4 7/8	3 7/8/3 13/16	3 7/8/3 13/16
July-Sept.	5 1/16/5 1/8	4 /4 1/8	4 /4 1/8
No. 2 Amber, spot	3 13/16/3 7/8	2 1/16	2 1/2
Feb.-Mar.	3 13/16/3 7/8		2 1/2
Apr.-June	3 13/16/4	2 1/16	2 5/8
July-Sept.	4 1/8	2 1/8	2 3/4/2 13/16
No. 3 Amber, spot	3 3/4/3 13/16	2 1/2	2 7/8
No. 1 Brown	3 13/16/3 7/8	2 5/16	2 1/2
No. 2 Brown	3 3/4/3 13/16	2 1/2	2 7/8
Brown, rolled	3 1/2	2 1/4	2 7/16
Paras			
Upriver fine	5 3/4	5 3/4	5 1/2
Upriver fine	*8 3/4	*9 1/4	*9 1/8
Upriver coarse	†2 1/2		
Upriver coarse	*5	*5	*4 3/4
Islands fine	†5		
Islands fine	*8 1/2	*9 1/4	*9
Acre, Bolivian fine	6	6	5 7/8
Acre, Bolivian fine	*9	*9 1/2	*9 1/4
Beni, Bolivian	6	6 1/4	6
Madeira fine	†5 3/4	5 3/4	5 5/8
Pontianak			
Bandjermasin	5 1/2	4 7/8	4
Pressed block	8	6 1/4	6 1/2
Sarawak	5 1/2	6 1/4	4
Caucho			
Upper ball	†2 1/2		
Upper ball	*5	*5	*4 3/4
Lower ball	†2		
Manicobas			
Manicoba, 30% guar.	†4 1/2	†2 1/4	†2 1/4
Mangabiera, thin sheet	†4 1/2		
Guayule			
Duro, washed and dried	13	12	12
Ampar	14	13	13
Africans			
Rio Nuñez	8	8	
Black Kassai	8	7 1/2	
Manihot cuttings	4	3 1/2	
Prime Niger flake	15	15	
Gutta Percha			
Gutta Siak	8 1/4	6 3/4	6 1/2
Gutta Soh	16 1/2	11 3/4	11
Red Macassar	2.00	1.50	1.75
Balata			
Block, Ciudad Bolivar	18	15 3/4	16 1/4
Manaos block	18	15 3/4	17
Surinam sheets	35	24 3/4	26
Amber	38	26 3/4	28

*Washed and dried crepe. Shipments from Brazil. †Nominal.

RECLAIMED RUBBER



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932					
January	8,569	8,333	29.8	21,084	475
February	8,547	8,227	27.4	21,024	484
March	8,431	7,326	26.3	22,226	476
April	5,555	5,561	21.4	21,525	370
May	5,024	6,070	20.8	18,889	188
June	5,923	7,031	18.0	16,870	259
July	5,417	5,131	18.2	16,333	240
August	3,264	4,382	19.6	14,629	147
September	5,308	5,235	23.3	14,059	265
October	6,605	5,494	26.1	13,911	203
November	6,542	5,234	23.9	14,047	226
December	5,626	3,968	23.4	15,202	203
1933					
January	5,245	4,506	20.8	15,117	...

*Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

THE hesitation characteristic of all industries was manifest in the reclaim market during the last month. Consumption increased over the low levels of December during January, and February figures are estimated to be at about the rate for the previous month. The ratio to crude declined from the December level because of an increase in crude consumption. However, a dealer who had just completed a trip to many sections of the country reported that the proportion of reclaim used by manufacturers had not fallen off appreciably; in fact the number of those returning to reclaim after trying crude only was encouraging. Even though reclaim is higher in price than crude, the saving in the larger costs of overhead makes up for the difference.

Consumption of reclaim at 4,506 tons was about 12% above the December level. January consumption of crude rubber, however, at 21,661 tons was 27.5% above the low December rate of 16,990 tons. On the other hand imports of crude were 31,110 tons in January against 28,567 for December, while production of reclaim declined to 5,245 tons from 5,626 in December.

The weather has been favorable for the boot and shoe industry for the first time in several years. December and January were good months, and the heavy snows in February are expected to help the industry have a good record that month.

The insulated wire manufacturers are at a monotonously low level. Building activities are just about at a standstill, and refrigerator manufacturers are not doing much either. Automobile accessories were generally slow although the snowstorms increased the sale of chains and windshield wipers. Tires and tubes have not improved over the dull rate which has prevailed for some time, but the hope is that a better than usual seasonal increase will occur this spring. Prices remained unchanged.

New York Quotations

February 25, 1933

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	5 /5¼
red	1.20	4¾/5
Auto Tire		
Black	1.21	3¾/4
Black selected tires	1.18	4 /4¼
Dark gray	1.35	5 /5¼
White	1.40	6 /6½
Shoe		
Unwashed	1.60	4¾/5
Washed	1.50	5½/5¾
Tube		
No. 1	1.00	6½
No. 2	1.10	4½/4¾
Truck Tire		
Truck tire, heavy gravity	1.55	5 /5¼
Truck tire, light gravity	1.40	5¼/5½
Miscellaneous		
Mechanical blends	1.60	3 /3½

RUBBER SCRAP

AS USUAL boots and shoes accounted for the little activity evident in scrap rubber in the past month. The heavy snowstorms found many people insufficiently clad for the inclement weather so that heavy footwear was in urgent demand. Because of this activity prices in scrap for boots and shoes were the only ones in the list that showed no drop during February. The largest declines were in tires, with mixed beads lower by 25¢ a ton, and beadless mixed tires lower by 50¢.

The weather, of course, prevented collectors from picking up much scrap, but manufacturers are well supplied in most grades, and the low prices are another deterrent to those making collections.

Should Congress show signs of tackling constructively the hard job ahead of it, the few instances of better business now reported will undoubtedly be multiplied.

BOOTS AND SHOES. Even though one snowstorm before Christmas is better than 2 after, as the adage goes, the weather in February left nothing to be desired as far as boot and shoe business was concerned. With storms that covered most of the country, and snow that will not melt for some time, the industry went into heavy production in many cases to supply the sudden demand. Prices are still extremely low, but it appears as though they will not go lower, and might turn upward if spring business is good.

TIRES AND TUBES. Demand for tire stocks is at a minimum. Tubes, however, are in better demand, and price changes in this grade were only fractional. The demand for solids for export has again improved; but since collectors have difficulty in picking up many solids these days, the demand has not been entirely met.

MECHANICALS AND HARD RUBBER. The only change in these grades was to lower prices. Air brake hose showed the largest drop, being $1.50 less than last month. Other changes were smaller, with hard rubber unchanged.

CONSUMERS' BUYING PRICES

Carload Lots Delivered Eastern Mills

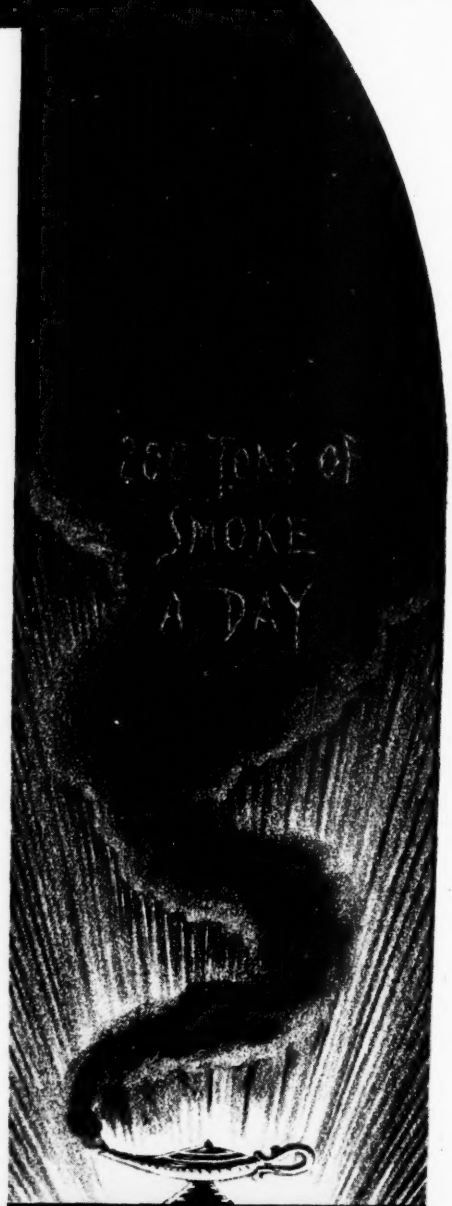
February 25, 1933

	Prices
Boots and Shoes	
Boots and shoes, black..100 *lb.*	$0.75/$0.90
Colored ..... 100 *lb.*	.625 /.75
Untrimmed arctics.....100 *lb.*	.50
Inner Tubes	
No. 1, floating ..... *lb.*	.02 /.02¼
No. 2, compound ..... *lb.*	.01⅛/.01¼
Red ..... *lb.*	.01⅜/.01½
Mixed tubes ..... *lb.*	.01⅛
Tires (Akron District)	
Pneumatic Standard	
Mixed auto tires with beads ..... *ton*	7.00/ 7.25
Beadless ..... *ton*	10.00/10.25
Auto tire carcass ..... *ton*	6.50/ 6.75
Black auto peelings .... *ton*	16.00/16.50
Solid	
Clean mixed truck.... *ton*	26.00/26.50
Light gravity ..... *ton*	28.00/29.00
Mechanicals	
Mixed black scrap ..... *lb.*	.00⅜/.005
Hose, air brake ..... *ton*	6.00 /6.50
Garden, rubber covered *lb.*	.00¼/.00⅜
Steam and water, soft... *lb.*	.00¾/.00⅞
No. 1 red ..... *lb.*	.01⅛/.01¼
No. 2 red ..... *lb.*	.01 /.01⅛
White druggists' sundries. *lb.*	.01¼/.01½
Mechanical ..... *lb.*	.00¾/.00⅞
Hard Rubber	
No. 1 hard rubber ..... *lb.*	.06¼/.06½

MICRONEX

MICRONEX plays the leading role not only in the modern long lived tire. It also assumes the vital part in *solings*, *taps* and *top lifts*.

When made with MICRONEX which combines maximum reinforcement with smoothness and freedom from grit, these goods have the toughness which means greatest resistance to flexing, abrasion and tear.



The Magic Lamp
Your Protection
for Over 50 Years

BINNEY & SMITH CO.

Specialists in CARBON BLACKS, STEARIC ACID, IRON OXIDES
MINERAL RUBBER *and other products for the* RUBBER INDUSTRY

41 E. 42nd St., New York

COMPOUNDING INGREDIENTS

THERE was no appreciable improvement during the past month in the demand for the usual rubber compounding ingredients. The best selling materials are those specialties that have gained popularity by demonstration of unusual merit. Research staffs are actively engaged in the development of compounding specialties despite the depression, or even inspired by it.

One of the more recent introductions is a line of aromatic chemicals known as Latex-O-Dors. These may be used in very small quantities in rubber compounding to counteract unpleasant odors and give to the finished products a fresher and cleaner smell.

In the matter of colors much interesting research is reported in progress to meet the demand for new attractive and permanent color values in rubber goods. Rubber master batch colors are offered in a great variety of brilliant tints suited to high grade goods.

No noteworthy changes occurred in the market situation on accelerators and antioxidants. The volume of sales is relatively small for obvious reasons, but prices on practically all types have remained unchanged. The chief reason for the steady prices of rubber chemicals and antioxidants is that the market for their sources, coal tar crudes, has held very firm because of restriction of their supply owing to extreme inactivity in the steel industry. When steel production is low, but little coke is used; consequently most by-product coke ovens are closed, and the production of coal tar by-products, such as benzene, toluene, xylene, etc., is greatly lessened. Since one of the principal outlets for these materials is in dyestuffs used by the textile industry, which has been doing very well, the demand for coal tar crudes has not fallen off enough materially to affect prices.

Antioxidants and organic accelerators are used in practically all rubber products; therefore the demand for these chemicals depends essentially upon the consumption of crude and reclaimed rubber. Domestic business is not feeling any noticeable competition from foreign chemical sources, but further demoralization of foreign currencies or reductions of our tariff protection would undoubtedly seriously affect domestic sources. Export sales of American made rubber chemicals are nearly at a standstill owing to high duties and differences in exchange.

Carbon black production has been curtailed materially at all points because of the very severe breakdown of the market last year. Thus the 1932 year-end stocks were considerably below those of the first of the year. Production will continue to be strictly limited, and as the tonnage demand is well maintained, the market appears very stable in all directions.

Stearic acid has slumped in price because of both the lower cost of tallows and greases and the great advance made by the hydrogenated materials. The future course of the market depends entirely upon the raw material base.

Titanium pigments of all grades showed increased sales by tonnage in January over the same month of 1932. A definite improvement occurred in the sale of Titanox-B (barium base), which is the most generally used of the 3 titanium pigments. In the rubber field satisfactory quantities of both Titanox-C (calcium base) and Pure Titanium Oxide are being used.

Factice, since the beginning of the year, has shown a marked improvement of business at prices slightly lower than those of the early part of 1932. The most disturbing factor is the uncertainty of tariff action by Congress.

New York Quotations

February 25, 1933

Prices Not Reported Will Be Supplied on Application

Abrasives

Pumicestone, pwd.	lb.	$0.02½/$0.04
Rottenstone, domestic	ton	23.50 /28.00

Accelerators, Inorganic

Lime, hydrated	ton	20.00
Litharge, com., pwd., casks	lb.	.05½
Magnesia, calcined, heavy	lb.	.04 / .04½
carbonate	lb.	.05¾/ .06

Accelerators, Organic

Accelerator 49	lb.	.38 / .48
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Barak	lb.	
BLE	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.42 / .52
DPG	lb.	.33 / .43
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	
Formaldehyde aniline	lb.	.37½/ .40
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.46 / 47
Lead oleate, No. 999	lb.	.08½
Witco	lb.	.10
Lithex	lb.	
Monex	lb.	
Novex	lb.	
Plastone	lb.	
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thiocarbanilid	lb.	.25 / .27
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
ZBX	lb.	
Zimate	lb.	

Acids

Acetic 28% (bbls.)	100 lbs.	$2.65 /$2.90
glacial (carboys)	100 lbs.	9.64 / 9.89
Sulphuric, 66°	ton	15.50

Age Resisters

Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
Neozone	lb.	
Permalux	lb.	
VGB	lb.	
Zalba	lb.	

Antiscorch Materials

UTB	lb.	

Antisun Materials

Heliozone	lb.	
Sunproof	lb.	

Binders, Fibrous

Cotton flock, dark	lb.	.09 / .10
dyed	lb.	.50
white	lb.	.11 / .16
Rayon flock, colored	lb.	1.75
white	lb.	1.40

Colors

BLACK

Bone, powdered	lb.	.05½/ .15
Drop	lb.	.05½/ .17
Lampblack (commercial)	lb.	.06 / .08

BLUE

Prussian	lb.	.35 / .37
Toners	lb.	.80 / 3.50
Ultramarine	lb.	.07 / .10

BROWN

Mapico	lb.	.14 / .15
Sienna, Italian, raw, pwd.	lb.	.04½/ .11

GREEN

Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
oxide	lb.	.19 / .21
Guignet's	lb.	.70
Toners	lb.	.85 / 3.50

ORANGE

Toners	lb.	.40 / 1.60

ORCHID

Toners	lb.	1.50 / 2.00

PINK

Toners	lb.	$1.50 /$4.00

PURPLE

Toners	lb.	.60 / 2.00

RED

Antimony		
Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
7-A	lb.	.32
Z-2	lb.	.18
Iron Oxides		
Rub-er-red	lb.	.08¾
Mapico	lb.	.08½/ .09
Toners	lb.	.80 / 2.00

WHITE

Lithopone	lb.	.04½/ .05
Albalith	lb.	.04½/ .04¾
Cryptone No. 19	lb.	.06 / .06¼
CB No. 21	lb.	.06 / .06¼
Grasselli	lb.	.04½/ .05
Titanium oxide, pure	lb.	.17 / .18¾
Titanox "B"	lb.	.06 / .06½
"C"	lb.	.06 / .06¼
Zinc Oxide		
Black label (lead free)	lb.	.05¾
F. P. Florence, green seal	lb.	.09⅝/ .09⅞
red seal	lb.	.08⅝/ .08⅞
white seal (bbls.)	lb.	.10⅞
Green label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.09⅝/ .10⅛
Horsehead (lead free) brand		
Selected	lb.	.05¾/ .06
Special	lb.	.05¾/ .06
XX	lb.	.05¾/ .06
green	lb.	.05¾/ .06
red	lb.	.05¾/ .06
Kadox, black label	lb.	.09⅝/ .09⅞
blue label	lb.	.08⅝/ .08⅞
red label	lb.	.07¼/ .07½
Lehigh (leaded)	lb.	.0490/ .0515
Red label (lead free)	lb.	.05¾
seal, Anaconda	lb.	.08⅝/ .09⅛
Standard (leaded)	lb.	.05½/ .05¾
Sterling (leaded)	lb	.05½/ .05¾
Superior (leaded)	lb.	.05½/ .05¾
U. S. P. (bbls.)	lb.	.12¾
White seal, Anaconda	lb.	.10⅞/ .11⅞
XX zinc sulphide (bbls.)	lb.	.13

YELLOW

Chrome	lb.	.15
Mapico	lb.	.11 / .12
Ochre, domestic	lb.	.01¾/ .02½
Toners	lb.	2.50

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine	ton		
Barytes (f.o.b. St. Louis)	ton	$23.00	
off color	ton		
white	ton		
Blanc fixe, dry, precip	ton	70.00	/75.00
pulp	ton	42.50	/45.00
Infusorial earth	ton		
Kalite No. 1	ton		
No. 3	ton		
Suprex, heavy	ton	45.00	/55.00
white, extra light	ton	60.00	/80.00
Whiting			
Chalk, precipitated	lb.	.03½/	.04
Domestic	ton	3.50	/ 5.00
Hakuenka	lb.		
Paris white, English cliff-stone	100 lbs.		
Sussex	ton		
Witco	ton	15.00	

Fillers for Pliability

Flex	lb.		
Fumonex	lb.	.02½/	.06
P-33	lb.		
Therman	lb.		
Velvetex	lb.	.02	/ .05

Finishes

Lacquer, rubber, No. 106	gal.	3.00	
Mica, amber	lb.	.04	
Starch, corn, pwd.	100 lbs.	2.19	/ 2.30
Talc, dusting	ton	20.00	
Pyrax A	ton		

Latex Compounding Ingredients

Accelerator 552	lb.		
Aquarex	lb.		
Catalpo	ton		
Colloidal color pastes	lb.		
sulphur	lb.		
zinc oxide	lb.		
Collway sulphur (dry basis)	lb.		
Disinfectants	lb.		
Dispersed Antox	lb		
Emulsified Heliozone	lb.		
Nekal BX (dry)	lb.		
Neozone L	lb.		
Tepidone	lb.		

Mineral Rubber

Genasco (fact'y)	ton		
Gilsonite (fact'y)	ton	37.34	/39.65
Granulated M. R.	ton		
Hydrocarbon, granulated	ton	40.00	/42.00
hard	ton		
solid	ton	30.00	/32.00
Parmr Grade 1	ton	23.00	/28.00
Grade 2	ton	23.00	/28.00

Mold Lubricants

Sericite	lb.		
Soapbark (cut)	lb.	.05½/	.06
Soapstone	ton	15.00	

Oils

Castor, blown	lb.	.11¼/$0.11¾	
Poppy seed	gal.	1.55	
Red, distilled (bbls)	lb.	.06	/ .06⅝

Protective Colloids

Casein, domestic	lb.	.07	/ .07½

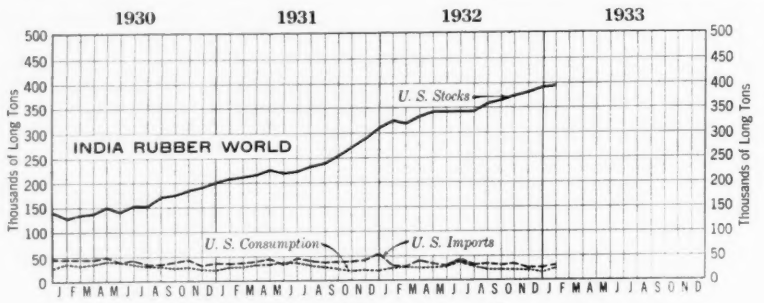
Reenforcers

Carbon Black			
Aerfloted arrow black	lb.	.02¾	
Arrow specification black	lb.	.03	
Century (works, c. l.)	lb.	.0272	
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.02¾	
c. l., f. o. b., works, cases	lb.	.04¼	
l. c. l., f. o. b. works	lb.	.04¼	
Spheron	lb.		
Dense dustless black (c. l., f. o. b. works)	lb.	.02¾	
Disperso (works, c l.)	lb.	.0272	
Dixie brand	lb.	.0272/	.06¼
Kosmos brand	lb.	.0272/	.06¼
Micronex	lb.	.032	
Ordinary (compressed or uncompressed)	lb.	.0295	
Clays			
Blue Ridge, dark	ton		
China	ton	7.50	
Dixie	ton		
Langford	ton		
Par	ton		
Perfection	ton	8.00	/22.00
Standard	ton	7.50	
Suprex No. 1	ton	8.00	
No. 2, dark	ton	6.50	
Glue, high grade	lb.	.18	/ .25

Reodorant

Amora A	lb.		
B	lb.		
C	lb.		
D	lb.		
Latex-O-Dors	lb.		
Rodo	lb.		

IMPORTS, CONSUMPTION, AND STOCKS



United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932									
January	31,298	27,962	322,860	42,234	125,276	59,836	63,627	50,480	507,962
February	30,546	30,012	322,117	51,728	125,958	56,684	59,871	51,230	504,759
March	42,382	27,828	334,566	44,190	124,975	51,072	58,977	63,324	510,838
April	37,017	25,953	343,098	40,387	123,235	48,303	57,232	57,450	514,637
May	32,224	29,197	346,231	50,453	116,015	47,015	62,434	56,156	509,261
June	41,394	39,116	345,702	43,079	109,509	28,671	57,713	72,300	483,102
July	31,078	28,272	345,927	37,894	106,085	24,206	60,812	56,720	474,218
August	34,219	22,372	357,342	42,846	104,315	27,595	59,130	54,280	489,252
September	29,509	22,491	365,789	46,188	103,091	27,975	58,577	53,600	496,659
October	35,473	21,018	373,823	40,176	99,901	30,711	55,173	48,275	504,435
November	27,080	21,910	377,996	40,879	96,223	34,078	57,174	55,300	508,297
December	28,567	16,990	388,229	38,360	92,567	36,802	59,140	51,135	517,598
1933									
January	31,110	21,661	396,376	32,539	.....	.....	.....	.....	.....

* Including liquid latex, but not guayule. † Stocks on hand the last of the month or year. ‡ W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

CONSUMPTION of crude rubber by manufacturers in the United States for January totaled 21,661 long tons, an increase of 27.5% over the 16,990 long tons for December, 1932, according to R. M. A. statistics. Consumption for January, 1932, was 27,962 long tons.

Imports of crude rubber for January amounted to 31,110 long tons, an increase of 8.9% above December, 1932, and less than 1% below January, 1932.

The Association estimates total domestic stocks of crude rubber on hand January 31 at 396,376 long tons, which compares with December 31, 1932, stocks of 388,229 long tons. January stocks show an increase of 2.1% against December, 1932, and 22.8% above the stocks of January 31, 1932.

Crude rubber afloat for the United States ports on January 31 is estimated at 32,539 long tons as compared with 38,360 long tons afloat on December 31, 1932, and 42,234 long tons afloat on January 31, 1932.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Jan. 28	36,852	52,415
Feb. 4	37,188	52,232
Feb. 11	37,396	52,434
Feb. 18	37,559	52,799
Feb. 25	37,603	52,955

Rubber Substitutes or Factice

Amberex	lb.	$.14¾	
Black	lb.	.06	/ .08
Brown	lb.	.06	/ .11
White	lb.	.06¾/	.12

Softeners

Burgundy pitch	lb.	.04	
Emo, brown	lb.	.05	
white	lb.	.07	
Hardwood pitch, c.l.	ton	25.80/	26.00
Palm oil (Witco)	lb.	.08	
Palmol	lb.	.08½	
Petrolatum, light amber	lb.	.02¾/	.02¼
Pine tar	lb.	.28	
Plastogen	lb.		
Rosin oil, compounded	gal.	.40	
Rubtack	lb.	.10	
Tonox	lb.		
Witco Flux	gal.	.10	

Solvents

Benzol (90% drums)	gal.	.25	
Bondogen	gal.		
Carbon bisulphide (drums)	lb.	.05½/	.12
tetrachloride	lb.	.06¾/	.09
Dependip	gal.		
Dip-Sol	gal.		
Dryolene, No. 9	gal.		
Petrobenzol	gal.		
Rub-Sol	gal.		
Solvent naphtha 284	gal.		
Stod-Sol	gal.		
Troluoil	gal.		
Turpentine, steam distilled	gal.	.42	/ .43

Stabilizers for Cure

Laurex, ton lots	lb.		
Stearex B	lb.	.07	/ .09
flake	lb.	.06½/	.08
Stearic acid, dbl. pres'd	lb.	.08	/ .12
Zinc stearate	lb.		

Vulcanizing Ingredients

Sulphur

Chloride, drum	lb.	.05	
Flowers, extrafine refined, U.S.P.	100 lbs.		
Rubber	100 lbs.	1.85	/ 2.60
Telloy	lb.		
Vandex	lb.		

COTTON AND FABRICS

THE revision of the domestic allotment plan and the substitution of the Smith Agricultural Bill were welcomed by farmers, mill men, and cooperatives. The cumbersome machinery, the doubt as to its efficacy in reducing the crop, and the prohibitive burden placed on tax payers for the benefit of special groups, raised so much opposition to the allotment plan that it died in committee.

The Smith Bill, a much simplified version of the allotment idea, has a fair chance of accomplishing its purpose, in the opinion of the various interests affected. Briefly the bill provides for a Cotton Board to take over by purchase the cotton now held by government agencies, estimated at about 3,500,000 bales, and for the purchase of cotton from producers, at market value, on their agreement to reduce acreage by 30%. The farmers entering into this agreement may buy the amount of cotton by which they promise to reduce their output from the government board. The cotton can then be sold for the account of the producer at market value, and no one entering the contract is liable for loss on a depreciated market.

At the time of this writing the bill has passed the Senate and gone on to the House, which has little more than a week left of its term in which to act upon it.

With all the merits the new plan has, it still does not guarantee a reduced acreage. Idle land may be put into cotton in the hopes that higher prices will prevail, owing to the passage of the bill. The Fossick Bureau reported that throughout the cotton belt early plantings indicate a crop as large, if not larger, than last year's. Farmers need the money; and if prices are lower, the only solution seems to them to be to sell more cotton at the lower prices. Bankers who usually lend funds for seed and equipment are doing their utmost to discourage production, but apparently are making little headway.

Estimates have been revised downward on several foreign crops, but not nearly enough to affect the total of 20,000,000 or more bales of cotton now in sight. American exports have fallen off by 200,000 bales from last year, largely because of foreign competition. The cotton spinning operated at a good level in January and February, but many manufacturers fear overproduction.

Week ended January 28. Moving in a narrow range cotton prices changed little in the past week. The widest spread was on Thursday when selling pressure depressed the market 4 to 6 points. Bullish and bearish factors just about balanced, with the reopening of the debt negotiations as the most constructive feature, offset by reports of increased acreage being planted here and in Egypt.

For the week, prices were unchanged to 6 points lower. February closed at 6.05¢, compared with 6.11¢ last week; March 6.10 against 6.12; May 6.23 against 6.25; July 6.37 unchanged; October 6.54 against 6.56; and December 6.69 against 6.70.

COTTON BEAR POINTS

1. Estimates of the Egyptian crop have been revised upward by 33 to 50%.
2. Exports for the season are now over 200,000 bales below those of last season.
3. Preliminary reports indicate that farmers are maintaining or increasing their cotton acreage.
4. The larger visible supply of cotton has increased hedging operations.
5. Cotton in world mills on December 31 was 3,155,000 bales against 2,514,000 a year ago and 2,805,000, 2 years ago.
6. World stocks of American cotton on December 31 were 20,096,000 bales against 20,581,000 the year before and 15,498,000, 2 seasons ago, about 6,746,000 bales above the 1927-1929 average which the New York Cotton Exchange terms normal.
7. January reports indicate fertilizer sales are larger than in last year.

COTTON BULL POINTS

1. The cotton spinning industry operated at 95.1% capacity in January against 87.2% in December and 84.5% in January, 1932.
2. The crops in Brazil, China, and India are now estimated at much lower figures than at the beginning of the season.
3. The passage of the Smith Agricultural Bill by the Senate has led to hopes that farm-relief legislation might be passed in time to affect the present crop.
4. Japanese consumption of cotton in January was equal to 230,000 bales of 500 pounds each against 226,000 in December and 216,000 in January, 1932.
5. December world consumption of cotton was put at 2,042,000 bales against 2,039,000 in November and 1,931,000 in December, 1931. Consumption of American cotton increased at the expense of foreign growths.
6. January consumption of cotton was 471,202 bales against 440,062 in December and 434,726 in January, 1932.
7. Cotton on hand January 31 in consuming establishments and public storage and compresses was less than on December 31 and on January 31, 1932.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Jan. 28	6.26
Feb. 4	5.98
Feb. 11	6.08
Feb. 18	6.08

The New York Times' index of cotton cloth production advanced in the January 21 week to 94.8, compared with 93.0 for the preceding week and 94.2 for the same week last year. With a moderate demand unfinished goods sold below the current rate of output, according to the New York Cotton Exchange Service.

But the Service in a report published early in the week stated that the cotton manufacturing industry operated at a rate approximately 50% above the average of all manufactured goods in the first 5 months of the season. The reasons given were that the goods produced were necessities and of a short life, and that the low prices had stimulated buying.

Both exports and spinners' takings are falling off, with the season's export figures now only 18,000 above last season's, and spinners' takings 16,000 less.

Last year, as the planting season started, private estimates showed declines of 10 to 20% in contemplated plantings, but so far this season indications are that the acreage will either be unchanged or increased. Planters hope to be able to meet interest and tax payments through the increase in acreage.

Week ended February 4. With declines of 16 to 21 points on the last 2 days of the month, cotton prices ended at the lowest points reached in January. The decline was carried over into the new month, but a rally on Friday lifted prices somewhat.

Several factors depressed the market. A survey from Memphis confirmed the fact that farmers were not cutting their acreage, exports were lower, sales of yarn in Manchester did not equal output, thus reducing imports from us, and heavy selling from the south all took their toll from quotations.

The declines aggregated 25 to 28 points. March closed at 5.83¢ compared with 6.10¢ the week before; May 5.97 against 6.23; July 6.09 against 6.37; October 6.29 against 6.54; and December 6.42 against 6.69.

Exports have fallen below last year's figures. For the season to date the figure is 5,063,000 bales, compared with 5,162,000 in the same period last year. In 1931, however, exports were only 4,580,000 bales. The fact that production in Manchester is exceeding sales has led to the belief that further imports of American cotton would be curtailed, especially since the present basis yields little profit.

Mill takings, while still above those of 1931, are below last year's. For the season to date takings are 7,432,000 bales, against 7,536,000 in 1932, and 6,235,000 in 1931.

The Fossick Bureau of Memphis issued a report saying that growers are not reducing their acreage, thus confirming reports made in the last 2 weeks. Besides The Cotton Exchange Service announced that fertilizer sales in 8 southern states totaled 76,000 tons in January, compared with 52,000 a year ago.

Last week buying in cotton cloths was of a fair volume, but a sharp drop this week served to depress prices, according to the New York Cotton Exchange.

The Times' cotton cloth index for the January 28 week was 96.5, compared with 94.8 for the preceding week, and 95.7 for the same week last year.

Week ended February 11. A new plan for reduced acreage, increased world consumption of cotton, and reports of moderate improvement in business helped the cotton market to recover most of the losses suffered last week. At the close gains were from 13 to 19 points.

March sold at 6.02¢, compared with 5.83¢ the week before; May 6.15 against 5.97; July 6.29 against 6.09; October 6.42 against 6.29; December 6.57 against 6.42; and January 6.63 against 6.47.

Under the new relief plan an agency would be formed to take over the 3,500,000 or so bales of cotton now held by the government. The cotton would be reserved for farmers who entered into an agreement to cut acreage approximately 30%. In the fall the cotton held would be sold, and any profit would be divided among the farmers who had followed the plan. The Senate Agricultural Committee reported favorably on the idea, and among traders it was looked upon as a welcome substitute for the domestic allotment plan which had been

opposed by manufacturers and consumers alike.

World consumption of cotton in December was 2,042,000 bales, according to the New York Cotton Exchange Service, compared with 2,039,000 bales in November, 1,931,000 in December, 1931, and 1,908,000 in December, 1930. For the first 5 months of the season the figure is 9,900,000 bales, against 9,686,000 in the same time last season and 9,081,000, 2 seasons ago.

"These increases are due entirely to a stepping-up of world consumption of American cotton," said the report, "accompanied by a decline in the use of foreign growths."

A report of the Association of Cotton Textile Merchants of New York showed that 884,000 spindles were scrapped in the industry during 1932, bringing the total scrapped since 1925 to 6,500,000 units. Production of cloth declined about 9%, and exports increased about 2½%.

"Economic improvement of even a reasonable degree cannot fail to uncover large shortages in these goods," concludes the report, "the making of which will again bring per capita consumption up to a more normal figure."

The outlook in cotton cloth at present is mixed. Production was above sales until last week; and although some traders believe that the unusually small stocks on hand bode well for another buying movement, others insist that there should be further curtailment in the face of a declining trend in sales.

Week ended February 18. With a short week due to the Lincoln holiday, cotton prices just about held their own. Outside factors were the principal influence on prices, with the banking holiday in Michigan, closing of the Japanese Exchange, and reports that the Egyptian government had abandoned its attempts to peg prices, all affecting prices adversely. The reported sales of 40,000 to 50,000 bales by the Farm Board also depressed the market early in the week. Sustaining influences were the belief that Congress would take action on some form of relief for the cotton farmer, the better sentiment induced because of the passage of the prohibition repeal bill by Congress, and a sharp reduction in the Brazilian crop.

For the week, prices were from one to 7 points higher. March contracts closed at 6.03¢ compared with 6.02¢ the week before; May 6.18 against 6.15; July 6.31 against 6.29; October 6.49 against 6.42; December 6.61 against 6.57; and January 6.67 against 6.63.

Hopes that the Lame-Duck Congress would at last act on farm relief legislation were strengthened by the unexpected passage of an almost straight prohibition bill. The Smith amendment is now being prepared for submission. To do any good, of course, the bill must be passed by the present session because by the time a special session is called the crop will be well under way.

January consumption of cotton as reported by the Census Bureau was 471,202 bales of lint, compared with 440,062 in December and 434,726 in January last year. Cotton on hand in consuming establishments and public storage and at compresses was about 150,000 bales less than last year. Exports in January were 793,666 bales of lint, compared with 1,039,795 in December and 919,815 in January, 1932.

Indian stocks on January 31 totaled 4,344,000 bales, compared with 3,624,000 the year before, 4,703,000, 2 years ago, and 5,293,000, 3 years ago.

Cotton cloth sales turned downward last week largely as a result of apprehension as to the effect the Michigan bank failure would have on sentiment throughout the country, it was stated. Production was at a high rate, and sales exceeded production until last week.

On the passage of the Smith bill by the Senate the cotton market scored advances up to 10 points on Monday, February 20, but realizing cut the gain, and prices ended even to 3 points off. On Tuesday liquidation continued, and quotations dropped 5 to 8 points more. The large supply of cotton on hand has resulted in an unusually large number of hedging contracts, especially against the March position, and with notices due on Thursday it depressed the market.

Exports continue to fall, and the total this season is now about 200,000 bales less than last season.

The Census Bureau in its monthly report said that the cotton spinning industry operated at 95.1% capacity on a single shift basis during January, compared with 87.2% in December, 1932, and 84.5% in January, 1932. Active spindle hours for January averaged 217 per spindle in place against 203 for December and 192 for January last year.

Although most foreign crop estimates have been lowered in the last month, reports just received from Alexandria show an increase of from 30 to 50% in its crop.

On February 23 the market took a downward swing caused by the weakness in stocks and generally unsatisfactory outside conditions. Spot middling cotton fell off 5 points to 6.55¢.

February 24 saw market conditions practically unchanged from the previous day.

New York Quotations

February 25, 1933

		Cents
Drills		
38-inch 2.00-yard	yd.	$0.07½
40-inch 3.47-yard		.04½
50-inch 1.52-yard		.10½
52-inch 1.90-yard		.08½
52-inch 2.20-yard		.07¾
52-inch 1.85-yard		.08⅝
Ducks		
38-inch 2.00-yard D. F.	yd.	.07⅝
40-inch 1.45-yard S. F.		.10¾
72-inch 1.05-yard D. F.		.14¾
72-inch 16.66-ounce		.16⅝
72-inch 17.21-ounce		.17
MECHANICAL		
Hose and belting	lb.	.17½
TENNIS		
52-inch 1.35-yard	yd.	.11¼
Hollands		
GOLD SEAL		
40-inch No. 72	yd.	.14
RED SEAL		
36-inch	yd.	.11
40-inch		.11½
50-inch		.17½
Osnaburgs		
40-inch 2.34-yard	yd.	.06¾
40-inch 2.48-yard		.06¼
40-inch 3.00-yard		.05⅛
40-inch 10-ounce part waste		.07¾
40-inch 7-ounce part waste		.05⅝
37-inch 2.42-yard		.06½
Raincoat Fabrics		
COTTON		
Bombazine 60 x 60	yd.	.07¾
Bombazine 60 x 48		.07¼
Plaids 60 x 48		.07½
Plaids 48 x 48		.06¾
Surface prints 60 x 60		.08¼
Surface prints 60 x 48		.07¾
Print cloth, 38½-inch, 64 x 60		.03¼
Print cloth, 38½-inch, 60 x 48		.02¾
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.04⅞
48 x 48, 2.85-yard		.04⅛
64 x 68, 3.15-yard		.04⅝
56 x 60, 3.60-yard		.04
44 x 48, 3.75-yard		.03⅜
44 x 40, 4.25-yard		.03⅛
SHEETINGS, 36-INCH		
48 x 44, 5.00-yard	yd.	.02⅝
44 x 40, 6.15-yard		.02 1/16
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.21¾
17¼ ounce 60" 10/5 ply Karded peeler	lb.	.17¾
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.21¾
12 ounce 60" 10/4 ply Karded peeler	lb.	.17¾
9¼ ounce 60" 20/4 ply Karded peeler	lb.	.23¼
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.17¼
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.23
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.24
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.21
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.20
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.19
23/5/3 Karded peeler, 1¼" cotton	lb.	.29¼
23/5/3 Karded Egyptian	lb.	.35
23/5/3 Combed Egyptian	lb.	.40¼
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.21¾

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The market remains exceptionally dull, characterized by hand-to-mouth buying. Very little inclination is apparent on the part of buyers to enter into contractual engagements for far-forward deliveries.

RAINCOAT FABRICS. The spring raincoat business is now starting up. It is evident that single texture printed garments will lead in the spring offerings as all manufacturers have a large range of patterns of these goods.

SHEETINGS. A somewhat disappointing feature in the current grey goods market is the virtual absence of the usual spring buying that is due in January and February. Retail demand has been so slack that converters and printers have not found it necessary to do much outside purchasing. They have held their spring lines to a bare minimum because of general business uncertainty. Even though prices are attractive, they will not take commitments for future delivery.

Production is at a very high rate; and unless steps are taken to adjust it in keeping with the rate of consumption, there may be considerable nearby yardage that cannot be disposed of.

TIRE FABRICS. Prices held quotably unchanged during February for carded Egyptian cords, combed Egyptian cords, and American carded peeler cords. About half of recent business has been confined to American carded peeler 15s, 3-3 ply, selling for about 17¢ a pound. Considerable interest still is evinced in the 23s, 5-3 ply, formerly the generally accepted standard.

CRUDE RUBBER

(Continued from page 56)

stead of late in the month or early in January so that unless sales justify continued production, the index is likely to decline sharply compared with last year.

Manufacturers, offering the finest cars at the lowest prices in a number of years, are conducting extensive sales campaigns. Preliminary reports indicate a good response for the larger companies in the low priced field, and cheered by this showing, they will probably continue their efforts.

Stagnation characterized the Outside Market last week. Even small factories did no buying, and there is a general tendency to wait for a few weeks until the new administration takes hold of the reins of government.

Prices eased fractionally on future positions. March sold at 3¢ unchanged from last week; April-June 3 1/16 against 3 1/8; July-September 3 3/16 against 3 1/4; and October-December 3 1/16 against 3 3/8.

Switching operations accounted for the bulk of the 2,150 long tons of crude rubber sold on the Exchange Monday, February 20. March and December contracts were exchanged in heavy volume, but the net result in prices was from one point higher to one point lower.

Pre-holiday trading on Tuesday was uneventful on the whole, though some outright buying was reported for short covering by foreign accounts through commission houses, and prices were unchanged to 3 points higher.

February consumption figures were estimated at 19,500 to 21,500 tons, compared with actual January consumption of 21,661 tons, and consumption of 30,012 tons in February, 1932.

In the automobile production centers, factories reported increased output in the majority of cases, but owing to the completion of dealer sampling by Chevrolet, the *Times'* index declined to 24.2 for the February 18 week, compared with 27.0 (revised) for the previous week and 37.1 for the corresponding week a year ago.

In the Outside Market business was unchanged from that of last week. Few sales were put through, and quotations slipped slightly.

Quotations on Monday and Tuesday were about the same. Nearby positions in ribbed smoked sheets sold at 2 15/16¢; March 3¢; April-June 3 1/16; July-September 3 3/16; and October-December 3 1/16.

On February 23 the tone of the market was quiet and steady. Futures closed barely steady, 3 to 6 points below the closing prices of February 21. Spot ribbed smoked sheets closed at 2.88¢, nominal. February 24, as on each day since the 14th inclusive, spot ribbed smoked sheets were steady at 2 13/16¢ with no interest apparent.

February 24 actuals were extremely dull at prices unchanged from the 23rd and with virtual absence of consumer demand.

Rubber Goods Production Statistics

	1932											1931
TIRES AND TUBES	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Nov.
Pneumatic casings												
Production ..... thousands	2,770	3,097	2,937	2,813	3,056	4,515	2,893	2,471	2,031	2,055	1,843	2,001
Shipments, total ..... thousands	2,602	2,042	2,363	2,958	3,406	8,293	1,923	2,124	2,466	1,439	1,369	2,310
Domestic ..... thousands	2,545	1,973	2,281	2,886	3,325	8,212	1,845	2,065	2,411	1,385	1,306	2,223
Stocks, end of month ..... thousands	6,329	7,338	7,902	7,877	7,503	3,700	4,962	5,327	4,877	5,501	5,964	6,335
Solid and cushion tires												
Production ..... thousands	9	10	9	8	8	11	10	8	8	6	6	9
Shipments, total ..... thousands	9	10	9	8	8	22	7	8	8	7	6	10
Domestic ..... thousands	9	9	9	8	8	22	7	7	7	7	5	10
Stocks, end of month ..... thousands	37	37	37	36	35	23	25	25	24	24	23	42
Inner tubes												
Production ..... thousands	2,719	3,057	2,802	2,580	2,727	4,223	2,350	2,199	2,081	1,749	1,604	1,955
Shipments, total ..... thousands	2,803	2,182	2,149	2,708	3,094	7,394	1,728	2,002	2,478	1,327	1,263	2,076
Domestic ..... thousands	2,761	2,135	2,094	2,658	3,035	7,336	1,674	1,966	2,440	1,292	1,221	2,022
Stocks, end of month ..... thousands	6,175	7,008	7,008	7,553	7,131	3,943	4,780	4,902	4,602	4,971	5,330	6,496
Raw material consumed												
Fabrics ..... thous. of lbs.	12,156	12,518	11,292	11,084	12,045	17,480	11,707	10,116	8,417	8,345	7,827	8,361
MISCELLANEOUS PRODUCTS												
Rubber bands, shipments ..... thous. of lbs.	206	208	223	202	187	180	160	199	210	315	170	197
Rubber clothing, calendered												
Orders, net ..... no. coats and sundries	20,720	12,388	13,970	7,303	12,503	10,433	9,109	13,321	31,577	35,417	22,353	14,341
Production ..... no. coats and sundries	10,130	20,405	17,649	9,711	12,886	15,333	26,849	28,284	22,770	35,306	38,704	23,255
Rubber-proofed fabrics, production,												
total ..... thous. of yds.	2,184	2,448	2,462	2,092	1,748	2,243	2,013	2,952	4,510	4,918	3,890	2,529
Auto fabrics ..... thous. of yds.	339	233	312	202	197	308	224	268	301	404	332	394
Raincoat fabrics ..... thous. of yds.	853	883	754	701	556	744	1,003	1,489	2,719	3,065	2,461	1,267
Rubber flooring, shipments ..... thous. of sq. ft.	358	376	422	546	399	546	329	434	421	383	307	462
Rubber and canvas footwear												
Production, total ..... thous. of pairs	3,557	3,777	3,787	4,104	4,518	4,429	2,321	3,576	3,767	4,139	5,007	4,217
Tennis ..... thous. of pairs	2,496	3,226	3,187	3,446	3,485	2,898	1,197	1,375	1,190	1,055	1,385	1,443
Waterproof ..... thous. of pairs	1,061	552	600	657	1,033	1,531	1,124	2,201	2,577	3,084	3,623	2,773
Shipments, total ..... thous. of pairs	3,990	4,454	4,998	5,073	5,049	4,345	2,985	3,342	4,641	5,234	5,375	3,720
Tennis ..... thous. of pairs	2,374	3,411	4,264	4,374	4,603	3,839	1,778	1,208	1,249	600	454	475
Waterproof ..... thous. of pairs	1,616	1,043	735	698	446	506	1,206	2,134	3,393	4,634	4,922	3,245
Shipments, domestic, total ..... thous. of pairs	3,962	4,416	4,943	5,010	4,966	4,285	2,942	3,272	4,589	5,189	5,330	3,632
Tennis ..... thous. of pairs	2,353	3,378	4,216	4,333	4,530	3,786	1,755	1,175	1,226	571	422	446
Waterproof ..... thous. of pairs	1,610	1,038	727	677	436	499	1,187	2,096	3,363	4,618	4,908	3,186
Stocks, total, end of month ..... thous. of pairs	20,237	19,551	19,347	18,381	17,879	17,962	17,317	17,358	16,483	15,388	15,038	20,367
Tennis ..... thous. of pairs	8,510	8,264	8,191	7,267	6,163	5,222	4,641	4,615	4,556	5,010	5,955	7,044
Waterproof ..... thous. of pairs	11,726	11,287	11,156	11,115	11,716	12,741	12,676	12,743	11,928	10,378	9,083	13,323
Rubber heels												
Production ..... thous. of pairs	12,316	14,787	16,368	11,737	10,259	11,299	9,868	11,073	14,205	16,736	14,162	11,455
Shipments												
Total ..... thous. of pairs	12,425	13,583	13,514	9,874	10,270	12,304	10,141	14,395	18,000	16,222	13,188	11,737
Export ..... thous. of pairs	290	259	305	280	275	266	261	187	297	233	184	591
Repair trade ..... thous. of pairs	3,431	4,575	3,785	2,656	3,651	3,708	2,449	4,260	5,520	5,012	3,966	4,537
Shoe manufacturers ..... thous. of pairs	8,704	8,748	9,424	6,938	6,345	8,330	7,432	9,948	12,183	10,977	9,038	6,610
Stocks, end of month ..... thous. of pairs	24,515	25,807	27,933	28,340	28,782	27,736	27,397	24,449	20,534	21,029	21,749	25,213
Rubber soles												
Production ..... thous. of pairs	3,411	3,461	3,953	2,292	2,488	2,461	2,419	2,599	4,054	5,081	4,780	2,840
Shipments, total ..... thous. of pairs	3,226	3,213	3,573	2,340	2,703	2,500	2,407	2,660	4,353	4,792	4,420	2,916
Export ..... thous. of pairs	8	3	2	1	4	5	14	12	7	4	5	29
Repair trade ..... thous. of pairs	264	285	252	252	151	133	113	140	215	269	316	308
Shoe manufacturers ..... thous. of pairs	2,954	2,925	3,320	2,087	2,549	2,362	2,280	2,508	4,131	4,519	4,099	2,579
Stocks, end of month ..... thous. of pairs	2,085	2,428	2,691	2,759	2,434	2,374	2,308	2,373	2,024	2,168	2,559	2,180
Mechanical rubber goods, shipments												
Total ..... thous. of dollars	2,463	2,446	2,638	2,613	2,542	2,672	2,024	2,152	1,975	2,192	1,990	2,300
Belting ..... thous. of dollars	483	483	491	430	420	526	524	563	456	481	423	483
Hose ..... thous. of dollars	903	966	1,174	1,251	1,131	1,095	734	785	706	844	709	856
Other ..... thous. of dollars	1,077	997	973	932	991	1,051	766	804	813	867	858	961

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

MAN, TWENTY-EIGHT, 6 YEARS' BROAD, PRACTICAL, AND technical experience in rubber industry with large companies. Knowledge compounding. Address Box No. 170, care of INDIA RUBBER WORLD.

TUBING FOREMAN: YOUNG MAN WITH PRACTICAL EXPERIence in running of druggists' sundries work, fountain syringe tubing, fine tubing of all kinds, catheters, washers, solid cord, etc., desires position. Best of references. Address Box No. 174, care of INDIA RUBBER WORLD.

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CHEMIST, B.SC., AGE 37, MARRIED, 12 YEARS' EXPERIENCE in alkalis, heavy chemicals, organic accelerators and analyses, rubber and rubber reclaiming, etc. Desires permanent position in rubber or allied industry. Address Box No. 176, care of INDIA RUBBER WORLD.

(Advertisements continued on page 69)

Imports by Customs Districts

	December, 1932 — Rubber Latex Pounds	Rubber Latex Value	Crude Rubber Pounds	Crude Rubber Value	December, 1931 — *Crude Rubber Pounds	*Crude Rubber Value
Massachusetts	435,214	$28,799	6,441,310	$200,589	5,256,776	$268,277
New York	912,374	46,938	53,995,380	1,840,421	107,591,579	5,072,469
Philadelphia	.....	.....	831,617	33,148	.....	.....
Maryland	.....	.....	1,637,735	56,307	4,304,858	170,064
Mobile	.....	.....	438,760	14,053	.....	.....
Georgia	.....	.....	.....	.....	179,480	7,310
New Orleans	.....	.....	179,200	5,412	463,680	17,097
Los Angeles	.....	.....	6,412,616	197,045	1,359,845	58,368
San Francisco	.....	.....	71,885	3,120	968,400	33,520
Oregon	.....	.....	11,200	491	.....	.....
Ohio	67,865	3,513	.....	.....	1,107	36
Colorado	.....	.....	280,000	9,475	425,600	24,759
Totals	1,415,453	$79,250	70,299,703	$2,360,061	120,551,325	$5,651,900

*Crude rubber including latex dry rubber content.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1574	Supplier of rosin soap 25 to 50% solution.
1575	Manufacturer of Sigal.
1576	Manufacturer of saw edged rubber rings for loosening jar caps.
1577	Manufacturer of rubber bridge table covers.
1578	Manufacturer of rubber knives and tomahawks.
1579	Manufacturer of Ethanite.
1580	Manufacturer of Lastex.
1581	Manufacturer of patch poles.

Tire Production Statistics

	Pneumatic Casings—All Types: Inventory	Production	Total Shipments	Solid and Cushion Tires: Inventory	Production	Total Shipments
1930	7,202,750	40,772,378	42,913,108	75,871	204,340	250,635
1931	6,219,776	38,992,220	40,048,552	38,815	136,261	167,555
1932						
Jan.	6,329,417	2,769,988	2,602,469	37,327	8,522	9,488
Feb.	7,337,796	3,096,976	2,042,289	37,242	9,754	9,541
Mar.	7,902,258	2,936,872	2,363,232	36,811	8,796	9,205
Apr.	7,876,656	2,813,489	2,958,104	35,816	7,980	8,436
May	7,502,953	3,056,050	3,406,493	35,179	8,026	8,405
June	3,999,260	4,514,663	8,051,932	22,988	11,171	22,474
July	4,962,285	2,893,463	1,923,276	25,218	9,656	7,104
Aug.	5,327,179	2,471,361	2,123,890	24,814	7,728	7,912
Sept.	4,876,878	2,030,976	2,465,828	23,732	6,755	7,868
Oct.	5,500,784	2,054,913	1,439,309	23,620	6,475	6,978
Nov.	5,963,554	1,842,836	1,369,038	22,613	5,635	5,810
Dec.	6,115,487	1,586,145	1,454,960	23,830	6,591	5,360

	Inner Tubes—All Types: Inventory	Production	Total Shipments	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1930	7,999,477	41,936,029	43,952,139	158,812,462	476,755,707	16,200,894,000
1931	6,337,570	38,666,376	40,017,175	151,143,715	456,615,428	16,941,750,000
1932						
Jan.	6,175,055	2,718,508	2,803,369	12,156,282	36,850,171	1,112,370,000
Feb.	7,007,567	3,056,988	2,182,405	12,518,243	39,472,356	1,071,840,000
Mar.	7,558,177	2,801,602	2,148,899	11,292,363	36,202,474	1,236,942,000
Apr.	7,552,674	2,579,768	2,708,186	11,083,556	35,416,482	1,270,080,000
May	7,130,625	2,727,462	3,093,593	12,044,956	37,681,119	1,326,738,000
June	4,139,358	4,222,816	7,215,371	17,480,486	57,358,548	1,627,920,000
July	4,779,814	2,349,761	1,727,750	11,706,987	38,406,905	1,315,020,000
Aug.	4,901,884	2,198,560	2,002,347	10,115,830	32,984,219	1,478,694,000
Sept.	4,602,160	2,081,146	2,478,234	8,417,417	27,577,826	1,413,720,000
Oct.	4,970,898	1,749,188	1,326,824	8,344,974	27,118,700	1,354,710,000
Nov.	5,329,819	1,604,071	1,262,634	7,827,250	24,411,266	1,272,600,000
Dec.	5,399,551	1,423,376	1,378,924	5,992,878	19,423,813	1,142,022,000

Rubber Manufacturers Association, Inc., figures representing approximately 80% of the industry with the exception of gasoline consumption.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for January, 1933:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	January, 1933 — Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	7,280	82
United States	19,699	120
Continent of Europe	10,307	197
British possessions	1,503	10
Japan	7,189	18
Other countries	193	1
Totals	46,171	428

Rubber Imports: Actual, by Land and Sea

From	January, 1933 — Dry Rubber Tons	Wet Rubber Tons
Sumatra	463	3,628
Dutch Borneo	220	1,763
Java and other Dutch islands	82	6
Sarawak	580	10
British Borneo	177	27
Burma	259	17
Siam	135	170
French Indo-China	239	25
Other countries	50	6
Totals	2,205	5,652

Plantation Rubber Crop Returns by Months

1932	Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies — Java (60 Companies) Long Tons	Index	Netherlands East Indies — Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	352	72.0	1,378	67.5	208	37.0	14,409	115.9	2,780	105.9	4,712	116.9	212	117.1	24,051	107.5
February	336	68.7	738	36.2	82	14.6	11,854	95.3	2,701	102.9	3,894	96.6	120	66.3	19,725	88.2
March	365	74.6	1,187	58.2	152	27.0	11,355	91.3	3,017	114.9	4,210	104.4	143	79.0	20,429	91.4
April	318	65.0	1,209	59.2	149	26.5	11,991	96.4	2,609	99.4	4,046	100.3	163	90.1	20,485	91.6
May	277	56.6	897	43.9	99	17.6	12,711	102.2	2,373	90.4	4,257	105.6	171	94.5	20,785	92.9
June	298	60.9	1,196	58.6	36	6.4	12,353	99.3	2,166	82.5	4,151	103.0	167	92.3	20,367	91.1
July	308	63.0	1,221	59.8	16	2.8	13,069	105.1	2,078	79.1	4,062	100.7	140	77.3	20,894	93.4
August	307	62.8	954	46.7	19	3.4	12,728	102.4	1,616	61.5	3,960	98.2	134	74.0	19,718	88.2
September	293	59.9	1,096	53.7	33	5.9	11,635	93.6	1,494	56.9	4,242	105.2	116	61.7	18,909	84.6
October	342	69.9	976	47.8	73	13.0	12,254	98.6	2,116	80.6	4,109	102.0	118	65.2	19,988	89.4
November	341	69.7	1,191	58.3	103	18.3	11,811	95.0	2,442	93.0	4,086	101.3	129	71.3	20,103	89.9
December	364	74.4	1,541	75.5	124	22.1	13,596	109.3	2,332	88.8	4,192	104.0	124	68.5	22,273	99.6
12 months ending December.																
1932	3,901	...	*13,584	...	1,094	...	149,766	...	27,724	...	49,921	...	1,737	...	247,727	...
1931	4,686	...	16,009	...	4,533	...	148,458	...	34,492	...	51,958	...	2,377	...	262,513	...

Note. Index figures throughout are based on the monthly average for 1929=100. Issued January 25, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Classified Advertisements

CONTINUED

BUSINESS OPPORTUNITIES

MANUFACTURER IS DESIROUS OF GETTING IN TOUCH WITH party who has new rubber ideas for purpose of manufacturing and selling. Address Box No. 172, care of INDIA RUBBER WORLD.

AN ESTABLISHED RESPONSIBLE ORGANIZATION IS seeking to buy or rent a small rubber plant within a radius of 100 miles from New York. Must be fully equipped to manufacture drug sundries and mechanical goods. Box 213, Realservice, 15 E. 40th St., New York, N. Y.

MACHINERY AND SUPPLIES FOR SALE

COMPLETE LINE OF W. & P. MIXERS, VACUUM SHELF DRIERS, calenders, mills, colloid mills, pebble mills, dough mixers, hydraulic presses, pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, N. Y. C.

United States Statistics

Imports of Crude and Manufactured Rubber

	November, 1931		November, 1932	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	100,436,474	$4,742,218	64,754,627	$2,263,469
Liquid latex	593,624	40,649	1,177,747	70,785
Jelutong or pontianak	618,758	50,062	364,319	20,296
Balata	79,583	11,539	300,028	15,983
Gutta percha	11,204	2,542	84,570	3,436
Siak, scrap, and reclaimed	691,027	4,304	599,413	2,439
Totals	102,430,670	$4,851,314	67,280,704	$2,376,408
Chicle, crude *Free*	621,432	$278,569	122,257	$40,578
MANUFACTURED—*Dutiable*				
Tires *number*	692	$4,561	10,017	$26,753
Other rubber manufactures	.....	111,832	.....	66,364
Totals	.....	$116,393	.....	$93,117

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,234,334	$202,764	3,905,106	$158,396
Balata	4,166	815	20,657	3,423
Guayule	.....	.....	3,400	408
Gutta percha, rubber substitutes, and scrap	.....	.....	.....	.....
Rubber manufactures	.....	1,145	.....	406
Totals	.....	$204,724	.....	$162,633

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	885,282	$37,921	506,090	$17,556
Scrap and old	5,453,242	94,586	3,521,703	54,259
Rubberized automobile cloth, *sq. yd.*	64,929	22,513	33,944	12,674
Other rubberized piece goods and hospital sheeting *sq. yd.*	163,730	53,152	63,014	19,375
Footwear				
Boots *pairs*	69,527	125,755	7,389	11,711
Shoes *pairs*	34,724	32,153	19,875	11,783
Canvas shoes with rubber soles *pairs*	20,448	13,486	18,825	12,847
Soles *doz. pairs*	6,084	14,178	1,307	2,751
Heels *doz. pairs*	66,182	40,401	21,845	13,001
Water bottles and fountain syringes *number*	35,091	14,991	20,470	6,906
Gloves *doz. pairs*	5,023	11,650	5,506	10,465
Other druggists' sundries	.....	28,347	.....	19,952
Balloons *gross*	48,825	45,624	36,072	24,314
Toys and balls	.....	4,906	.....	5,259
Bathing caps *doz.*	1,836	3,402	1,080	2,051
Bands	38,055	11,744	22,558	6,360
Erasers	21,209	12,594	37,939	18,966
Hard rubber goods				
Electrical goods	160,259	17,906	73,916	6,132
Other goods	.....	15,181	.....	10,026
Tires				
Truck and bus casings, *number*	26,702	423,326	11,563	195,822
Other automobile casings, *number*	78,113	647,680	66,043	423,617
Tubes, auto *number*	70,607	95,352	43,273	45,532
Other casings and tubes, *number*	3,027	6,499	1,594	2,578
Solid tires for automobiles and motor trucks *number*	688	21,675	854	16,917
Other solid tires	178,329	21,337	75,511	9,092
Tire sundries and repair materials	.....	49,004	.....	36,013
Rubber and friction tape	57,238	13,819	57,971	12,364
Belting	163,719	66,780	136,782	57,570
Hose	286,971	80,960	253,940	61,931
Packing	76,658	32,537	92,478	30,467
Thread	221,127	138,720	127,338	67,409
Other rubber manufactures	.....	131,245	.....	99,467
Totals	.....	$2,329,424	.....	$1,325,167

World Rubber Shipments—Net Exports

Long Tons—1932

British Malaya	July	Aug.	Sept.	Oct.	Nov.	Dec.
Gross exports	40,723	39,327	41,973	37,931	40,098	40,118
Imports	5,346	7,371	8,869	9,798	10,072	10,089
Net	35,377	31,956	33,104	28,133	30,026	30,029
Ceylon	3,501	4,717	5,238	2,945	4,146	5,801
India and Burma	99	129	122	139	185	367
Sarawak	442	506	614	583	683	644
British N. Borneo	350	350	637	400	400	400
Siam	184	300	340	428	371	406
Java and Madura	5,779	4,803	3,858	4,022	4,368	4,683
Sumatra E. Coast	6,257	4,882	6,485	7,051	6,250	7,066
Other N. E. Indies	6,145	7,244	7,664	8,944	9,080	8,594
French Indo-China	1,233	1,088	1,621	1,147	809	1,211
Amazon Valley	232	303	318	414	1,164	824
Other America	....	....	....	....	2	....
Africa	141	49	78	247	154	*120
Totals	59,740	56,327	60,079	54,453	57,638	60,145

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

Low and High New York Spot Prices

	February		
PLANTATIONS	1933*	1932	1931
Thin latex crepe	3 5/16–3 11/16	4 3/16–4 7/16	7 1/2–8 1/4
Smoked sheet, ribbed	2 13/16–3	3 3/16–4 1/4	7 1/4–8
PARAS			
Upriver fine	6	5 1/4–5 1/2	9 1/4

*Figured to February 25, 1933. All prices in cents per pound.

London Stocks, December, 1932

			Stocks, December 31		
LONDON	Landed Tons	Delivered Tons	1932 Tons	1931 Tons	1930 Tons
Plantation	2,152	5,365	37,358	69,430	77,912
Other grades	14	.....	49	40	54
LIVERPOOL					
Plantation	*1,703	*2,160	*55,160	*57,633	*40,549
Total tons, London and Liverpool	3,869	7,525	92,567	127,103	118,515

*Official returns from the recognized public warehouses.

World Rubber Absorption—Net Imports

Long Tons—1932

CONSUMPTION	Sept.	Oct.	Nov.	Dec.
United States	22,565	21,087	21,981	17,046
United Kingdom	6,901	7,821	9,513	6,577
NET IMPORTS				
Australia	625	569	1,653	.....
Austria	195	308	233	163
Belgium	964	627	1,035	.....
Canada	2,770	1,207	1,593	941
Czechoslovakia	*406	986	650	.....
Denmark	90	124	91	73
Finland	36	76	106	80
France	5,845	4,715	3,830	3,205
Germany	3,674	4,177	3,577	4,623
Italy	970	510	1,265	.....
Japan	5,878	5,653	4,563	5,603
Netherlands	403	553	275	348
Norway	104	151	58	110
Russia	1,376	1,853	1,481	.....
Spain	267	489	631	485
Sweden	304	188	234	281
Switzerland	62	65	72	65
Others	*800	*800	*800	*800
Totals	53,935	51,959	53,641	.....
Minus United States (Cons.)	22,565	21,087	21,981	17,046
Total foreign	31,370	30,872	31,660	...

*Estimate. *Compiled by Rubber Division, Washington, D. C.*

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
2,537	Tires	Sabadell, Spain
$2,557	Surgeons' gloves, nipples, and other hospital and druggists' goods	Toronto, Canada
$2,561	Packing	Toronto, Canada
$2,665	Tires and tubes	Damascus, Syria
$2,666	Hospital and surgeons' goods	Toronto, Canada
2,667	Rubberized raincoat material	Buenos Aires, Argentina
‡2,669	Tires and tubes	Asnieres, France
*2,673	Floor tiles	Medan, Sumatra
‡2,676	Bathing caps and shoes and tennis shoes	Alexandria, Egypt
‡2,713	Sanitary goods and sundries	Istanbul, Turkey
‡2,757	Pneumatic tires	Haifa, Palestine
2,758	Inflatable boat	Christchurch, New Zealand
‡2,812	Bathing caps, slippers, surf balls, erasers, elastic bands, and household articles	Amsterdam, Netherlands
‡2,813	Sponge rubber cushions	Toronto, Canada
*2,814	Dental rubber	Berlin, Germany
‡2,818	Dental rubber	Berlin, Germany
‡2,855	Tennis shoes	Rome, Italy
‡2,856	Golf balls	Paris, France
*2,866	Medicated foot appliances	Melbourne, Australia
‡2,881	Overshoes	Berlin, Germany
‡2,882	Bathing caps	Vancouver, Canada
‡2,885	Sport goods	Johannesburg, S. Africa
‡2,942	Druggists' sundries	Vancouver, Canada
*2,972	Rubber vulcanizing and recovering machinery	Chihuahua, Mexico
*2,973	Tire factory equipment	Palma de Mallorce, Spain
‡3,013	Tennis shoes and bathing slippers	Curacao, N. W. I.
‡3,022	Sponge rubber articles	Buenos Aires, Argentina
*3,023	Tires and tubes	Madras, India
‡3,084	Bicycle tires	Lagos, Nigeria
*3,097	Hard rubber or composition battery boxes	Vancouver, Canada
*3,108	Hose and heels	La Paz, Bolivia
‡3,122	Scrap rubber	Buenos Aires, Argentina
*3,123	Cowboy overshoes	Calgary, Canada
*3,150	2-Way stretch corset elastic	Amsterdam, Netherlands
*3,166	Rubber scrap	Kobe, Japan

*Purchase. †Agency. ‡Purchase or agency, or both. §Either.